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United States Coast Guard

Commandant
United States Coast Guard

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COMDTINST 1554.1
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COMMANDANT INSTRUCTION 1554.1

Subj: DEVELOPMENT AND MANAGEMENT OF INTERACTIVE COURSEWARE (ICW) FOR COAST GUARD TRAINING

Ref: (a) Coast Guard Information Technology Management Strategy, COMDINST 5230.58

(b) Management of the Coast Guard Training System, COMDTINST 1550.9 (series)

(c) Coast Guard Training and Education Manual, COMDTINST 1500.10 (series)

1. PURPOSE. This instruction establishes Coast Guard policy, prescribes procedures, assigns responsibilities and establishes requirements for the development and management of interactive courseware (ICW).

2. ACTION. Area and district commanders, commanders of maintenance and logistics commands, commanding officers of Headquarters units, assistant commandant for directorates, chief counsel, and special staff offices at Headquarters shall ensure compliance with the provisions of this Instruction.

3. BACKGROUND. Training technologies can now incorporate and store expert knowledge and skills through computers and other communication technologies. For the purposes of this instruction, ICW encompasses computer-based training (CBT), computer-based instruction (CBI), interactive multimedia instruction (IMI), and their variant forms. ICW is becoming a prevalent training technology and is expected to be even more widespread by the year 2000. ICW is computer controlled courseware that incorporates more than one type of medium (e.g. audio, text, graphics) to convey instructional content and relies on learner interactions to determine the pace, sequencing and content of instructional delivery. It can be delivered from CD/ROM, installed software or through an inter/intranet. ICW is often a cost effective, efficient and valuable training delivery method. It can be used as a stand-alone course of instruction or combined with classroom instruction, electronic performance support systems, interactive electronic technical and operating manuals, and other distance learning tools. The trend is toward increasing hybridization of multiple instructional approaches. ICW enables learners to perform required tasks, provides remediation and testing, and documents learning. This instruction supplements reference (a) which provides overall direction for managing Coast Guard technology resources.

4. APPLICABILITY AND SCOPE. This instruction applies to ICW selection, design, and development implementation, management and maintenance by or for the Coast Guard. Full-scale simulators (i.e. a full-motion, multi-axis cockpit or bridge simulator) are not considered ICW for the purposes of this instruction and are excluded from the provisions of this instruction.

5. DEFINITIONS. The terms used in this instruction are defined in enclosure (1), ICW Standards and Styles Guide (series).

6. POLICY.

   a. A needs assessment shall precede a decision to build a training course or program. Once training is determined to be necessary, the optimal delivery method can be determined as part of a training analysis. Contact G-WTT for assistance in obtaining needs assessments or training analysis support.

   b. During training analysis, media selection models are used to evaluate training delivery options. Media selection models take into account the large number of factors that impact a student's ability to learn. Performance Technology Center (PTC) Yorktown generated media selection models should be used when making media decisions for training. Life cycle cost analysis shall be conducted for all media options considered. Typical costs include updating media and course content, distributing revised courseware, and administrative overhead associated with the change. Determining which organization will monitor, update, and distribute revised courseware is a key factor in computing accurate life cycle costs.

   c. The decision to use ICW as a delivery medium in a training course or program must be weighed against other delivery options and must provide a clear advantage in terms of cost, breadth of distribution, and/or learning advantage.

   d. Preauthoring tools used to prepare subject matter for authoring as an ICW program shall be capable of displaying tasks and their objectives in an appropriate integrated hierarchy that suggests effective and consistent design and development. In addition, the tool requires an export capability for predesign plans and storyboards and a capability to automate and guide predesign work for other instructional strategies. Contact the PTC for preauthoring tools that meet these requirements.

   e. PTC Yorktown has trained contracting officer technical representatives (COTR) who are familiar with ICW design and development standards, methodologies, and protocols. They will provide assistance to acquisition personnel on ICW contract issues and, depending on availability may be tasked as COTR for a multimedia/ICW development contract.

   f. Copyright clearances must be obtained prior to the use of any Copyrighted/protected materials Developers will strictly comply with applicable copyright laws and regulations.

g. All ICW courseware developed for or by the Coast Guard shall be entered into the Defense Instructional Technology Information System (DITIS). DITIS appropriate materials shall be made available for inclusion in other interagency archiving and distribution systems (i.e. US Navy Shipboard Training and Education Program (STEP)).

h. Prior to ICW development, acquisition, training and program managers must conduct a search and review of available commercial off-the-shelf (COTS), government off-the-shelf (GOTS) products and query the DITIS inventory to determine if pre-existing ICW can be purchased, used, or effectively modified to satisfy the training need. The review should determine if existing materials are instructionally sound and can meet the instructional needs determined by training assessment/analysis. PTC Yorktown can assist in this review.

i. Reproduction master materials shall be archived for the life cycle of each ICW program in accordance with COMDTINST M5212.12 (series), Paperwork Management Manual. An indexed inventory and archive of media resources (such as graphics, sound files, and templates) shall also be maintained.

j. The standard approved authoring tool for Coast Guard ICW development is Macromedia's Authorware. Using a standard authoring tool reduces the cost associated with life cycle support and offers increased opportunities to reuse courseware components, saving production costs. For developers intending a Web Based Implementation of ICW, Macromedia's Shockwave (a product that converts the ICW to a web compatible format) is the standard conversion program to be used in conjunction with the Authorware development tool. This technology includes the use of plug-ins on the user workstation that is installed as part of the Coast Guard Standard Image Web Browser. A written waiver must be obtained from PTC Yorktown prior to initiating any new Coast Guard ICW acquisitions via contract, purchase order, delivery order, or internal development project which propose a different authoring or conversion tool. This policy is designed to minimize initial ICW production costs and life cycle support and maintenance for Coast Guard specific ICW.

k. ICW programs for any Coast Guard application must operate on standard workstation III (SWSIII) and its variants, without the need for significant software or hardware modification. PTC Yorktown and the Coast Guard Telecommunications and Information Systems Command (TISCOM) shall approve courseware prior to its distribution.

l. All ICW programs developed for or by the Coast Guard will follow the standards, styles, and technical requirements documented in enclosure (1), ICW Standards and Styles Guide (series). COTRs and in-house developers are encouraged to use MIL-PRF 29612 (Performance Specification, Training Data Product) and MIL-HDBK-612 for further guidance.

m. ICW developed by or for the Coast Guard shall include the capability to export training data to an embedded training management system that captures, at a minimum, student name, student SSN, test results, date of testing, course completion and date of course completion. A recommended training management system is Macromedia's Pathware. In addition, developers shall ensure that data element naming and sizing supports data element integration into the People-soft training management system. Coordination with G-WR will eliminate difficult conversions as courseware data is incorporated into the Human Resources Management System.

7. RESPONSIBILITIES.

a. The Director of Reserve and Training (G-WT) shall:

1. Coordinate the development of ICW policy with Chief, Office of Architecture and Planning (G-SIA).

2. Promulgate ICW policy.

3. Provide adequate representation on all acquisition projects requiring ICW development.

4. Evaluate the implementation and effectiveness of ICW policy.

5. Review requests for waivers and changes to this instruction.

b. The Assistant Commandant for Acquisition (G-A) shall:

1. Provide a list of suitable contract vehicles for ICW design and development.

2. Ensure requests for COTR's for ICW contracts are coordinated with PTC Yorktown.

3. Inform G-WT of all new major and minor approvals which occur in Key Decision Point 1 (KDP-1) of the acquisition process.

c. The Chief, Office of Architecture and Planning (G-SIA) shall: - Coordinate information management decisions, which impact ICW design, development, implementation or maintenance with Chief, Office of Training and Performance Consulting (G-WTT).

d. The Chief, Performance Technology Center (PTC), Reserve Training Center Yorktown shall:

1. Maintain the Coast Guard ICW Standards and Styles Guide (series), enclosure (1).

2. Research, identify, and approve tools for ICW analysis, design, development, implementation, production, evaluation and maintenance.

3. Audit and recommend changes to ICW design, development, implementation maintenance policies and procedures.

4. Archive and disseminate, via Intranet, Internet and mail, ICW instructional media (e.g. graphics, audio clips, and videos) in conjunction with Chief, Public Affairs Staff (G-CP). This includes maintaining an indexed listing of instructional media resources available through the Internet.

5. Provide Coast Guard ICW information to ICW developers, including assistance with DITIS Inquiries, COTS/GOTS searches, accessing archived materials, tool use, authoring, and course management.

6. Maintain inventories of ICW programs in DITIS and COTS/GOTS search results. Input Coast Guard generated products into DITIS and other appropriate archiving and library systems.

7. Provide (G-A), Program Managers, and Project Managers with assistance in selecting a COTR with skills necessary to administer an ICW design and delivery contract prior to writing the contract specifications. This may include assigning a PTC Yorktown staff member with the requisite ICW skills and COTR training to a project or contract. Assist Program and Project Managers in securing copyright clearances, waivers, and releases for protected ICW program materials.

8. Develop Coast Guard ICW standards for designers, developers and/or project managers. This can include curriculum, administrative support tools/processes, and conducting on-the-job training (OJT) for ICW design, development, and project management.

9. Approve waivers for use of non-standard authoring tools and for deviations from ICW Standards and Styles Guide (series), enclosure (1).

10. Provide PTC Yorktown approved media selection models for Coast Guard use.

11. Resources permitting, provide an agenda and host an annual ICW Conference for Coast Guard personnel involved in the acquisition, design, development, or maintenance of Coast Guard ICW.

12. Provide appropriate representation to Department of Defense Interservice CBT and distance learning committees.

13. Coordinate with Chief, Office of Computer Systems, (G-SCC) and TISCOM on ICW compatibility with Coast Guard Workstation III and Standard Image.

14. Assist Program and Project Managers in determining life cycle support methodologies and costs.

e. The Commanding Officer/Commander TISCOM shall assist PTC Yorktown in implementing ICW across the Coast Guard SWSIII operating environment.

f. Program and Project Managers shall:

1. Implement ICW design, development, and implementation policy and procedures consistent with this instruction.

2. Encourage the use and sharing of approved ICW materials to reduce acquisition and life cycle management costs.

3. Plan, program, and budget for ICW life cycle maintenance as well as initial development.

4. Coordinate with PTC Yorktown for life cycle management of ICW programs.

5. Ensure that data submitted to PTC Yorktown for entry into DITIS is complete, current, and accurate. Provide PTC Yorktown with results of COTS/GOTS searches and ICW evaluations.

6. To the extent authorized by Federal Acquisition Regulations (FAR), obtain unlimited rights or Government-purpose license rights to courseware, associated presentation programs necessary to interpret and execute the courseware, documentation, and associated training materials for all ICW programs developed for or by the Coast Guard. These rights shall include royalty-free rights to use, duplicate, and disclose data for Government purposes and to permit others to do so for Government applications. They also include appropriate copyright clearances, releases, and waivers for use of copyrighted materials. For assistance regarding copyrighted clearances, contact PTC at Coast Guard Reserve Training Center, Yorktown, VA.

8. PROCEDURES. Enclosure (1) the ICW Standards and Styles Guide (series), provides specific guidance and rules for designing, developing, implementing, and maintaining ICW in the Coast Guard. Questions, comments, and recommended changes to the ICW Standards and Styles Guide (series) and this instruction are welcome and should be directed to PTC Yorktown.

/s/ T. J. BARRETT
Director of Reserve and Training

Encl: (1) ICW Standards and Styles Guide (series)

Interactive Courseware (ICW) Standards & Styles Guide

Performance Technology Center

United States Coast Guard
Reserve Training Center
Yorktown, Virginia
Version 1-a

Executive Summary

The "Interactive Courseware Standards & Style Guide" was developed cooperatively by the USCG ICW Natural Working group, with special thanks to:

Commandant (G-WTT-2)

Research and Development Center

Coast Guard Institute

ATC Mobile

TRACEN Cape May

TRACEN Petaluma

ATTC Elizabeth City

Performance Technology Center RTC Yorktown

This guide is intended for both experienced and novice ICW developers. This guide provides the following:

A frame of reference to aid you during the design and development process. Help to document the decisions and material incorporated into your final ICW product. Established ICW design and development conventions from a variety of military and civilian sources.

This guide can also help you communicate ICW *requirements (e.g., design conventions, evaluation of deliverables)* to contractors or external developers of Coast Guard ICW products.

Table of Contents

Introduction

Purpose

This style guide was prepared to help Interactive Courseware (ICW) designers and developers determine strategies, conventions, and standards. *This style guide can also be used when communicating* specific ICW design and development requirements (e.g., design conventions, evaluation of deliverables) to contractors. The information provided in *this style guide* should be used only as a tool in the design and development of ICW. Due to the dynamic nature of ICW development, you may need to alter, change, or modify the guidance you find in the style guide to accommodate customer requirements or a specific project requirement. Checklists and flowcharts are not hard and fast performance blueprints. Rather, they are offered to help you document and complete ICW projects.

Note: This style guide should only be used after the decision to develop ICW has already been made via front-end analysis.

Living Document

This style guide is a "living" document that will become more exact and detailed through application and feedback. With each revision, less work effort will be required to make decisions concerning ICW conventions and standards. Additionally, ICW is still an evolving training media and Coast Guard training should benefit from any new developments. You are strongly encouraged to provide feedback regarding the guide. Tell us where the weak areas or gaps are! Send your comments, recommendations, additions/deletions, and data related to this guide by e-mail or the enclosed recommendation form to: PTC, RTC Yorktown/e-mail address).

Precedence

Guidance provided in this document is not intended to supplement or duplicate policies and procedures in other applicable directives, regulations or doctrines. Please inform *PTC* of any conflicts you observe.

Policy

Official policy for USCG Development and Management of Interactive Courseware is found in COMDTINST 1554.1 (series)

ICW

Interactive Courseware (ICW), for the purpose of this document, is defined as computer controlled courseware that relies on trainee input to determine the pace, sequence, and content of training delivery using more than one type medium to convey the content of instruction.

Instructional Systems Design

The Instructional Systems Development (ISD) process provides you with a framework for developing and delivering Coast Guard training. The ISD process ensures that training requirements are established and translated into appropriate instructional objectives. ISD can also help you determine the best method to translate objectives into deliverable training. This process includes selecting suitable delivery medium, media, and instructional technique. Time spent in properly matching training needs to media capabilities will ensure today's selected state-of-the-art technologies do not become tomorrow's dust collectors. This style guide does not provide you with detailed guidance related to ISD. However, it does incorporate ISD principals. COMDTNST 1550.9 (series) contains additional information related to the ISD model.

ICW Acquisition/ Development Checklist

Appendix A is a self-use checklist to be used when acquiring or developing ICW products. The checklist is divided into two sections: Section 1 enables the development/acquisition team to determine if existing off the shelf (OTS) courseware meets project instructional goals IAW COMDTINST 1554.1 (series). Section 2 is an exhaustive checklist of suggested ICW characteristics to be used when evaluating or developing ICW products.

Working with Contractors

When working on an ICW project as a designer or SME, you may find yourself working with a contract vendor who is responsible for producing part or all of the ICW product. The decision of when to work with a contractor will be made by the owner of the ICW product (HQ level Program manager, ICW level project manager), and shall be based upon cost benefit analysis and other data.

Your involvement in the contractual ICW development process may include:

Acting as the program manager's Contract Officer's Technical Representative (COTR). Some of your responsibilities may include:

- Quality assurance (e.g. ensuring adherence to Coast Guard standards and policy, instructional integrity, etc.)
- Reviewing statements of work (SOW)

Statement of Work

A statement of work (SOW) states the government's needs in terms of work tasks (e.g., work to be performed in developing or producing the goods to be delivered or services to be performed by a contractor).
Some key elements of SOW are:

- Background
- Scope
- Applicable Documents
- Technical Requirements
- Supporting Documentation
- Security
- Contracting Officers Technical Representative

When planning a SOW, it is recommended that the ICW Project Manager communicate contract needs with the contracting staff for guidance at the earliest opportunity. An example of an ICW SOW can be found in Appendix B. Further information can be found in COMDTINST M4200.19e, Guidance for Contracting Personnel , or the Federal Acquisitions Regulations (FAR).

ICW Naming Conventions

Rationale	Multimedia developers typically produce many versions of the same files during the ICW development process. Tracking these files can pose a significant management problem unless developers and reviewers follow a standardized file naming convention.
Sample Format	The following format is recommended as a file/project naming convention. Although you can adopt your own naming convention using this one should make it easier to access and use files from other Coast Guard development teams. The following example is for a HH60 hydraulics system.
Sample Name	**HH60_Hydraulics_LFI_1.0_01608.a3w**

Project Name	Use a descriptive names that range from general - specific. Use underscores between words and to separate sections	**HH60_Hydraulics_LFI**_1.0_01608.a3w
Version/ Release	This number denotes major release and the next release would be 2.0, etc.	HH60_Hydraulics_LFI_**1.0**_01608.a3w
5 Digit Dev. Number	The development number is used to designate where the file is at in the review cycle.	HH60_Hydraulics_LFI_1.0_**01608.** a3w
1st digit	Vacant - unit preference.	HH60_Hydraulics_LFI_1.0_**0**1608.a3w
2nd digit	Customer - user review. This file has been reviewed by the customers/users once.	HH60_Hydraulics_LFI_1.0_0**1**608.a3w
3rd digit	SME review. This file has been reviewed by the development teams SME's six times.	HH60_Hydraulics_LFI_1.0_01**6**08.a3w
4th/5th digit	Development team revision or version. NOT the finished program version. This is the eighth version of this file produced by the development team	HH60_Hydraulics_LFI_1.0_016**08**.a3w
file ext.	Based on program type. This is for an Authorware program.	HH60_Hydraulics_LFI_1.0_01608. **a3w**

Minimum ICW Elements

The goal of ICW training is to provide cost effective, realistic, and performance-based training in a variety of learning environments (i.e., shipboard, remote SAR units, etc.). To reach this goal, at a minimum, the following elements are recommended:

- A user-friendly interface and consistent lesson structure.
- "Bite-sized" instructional blocks to provide meaningful training.
- Rapid exit from the course with "bookmarking" restart capability.
- Extensive use of help routines and remediation.
- Use of diagnostic pretests to determine prior knowledge and skills.
- Individualized, tailored instruction (i.e., based upon pretest scores).
- Confirmation of learning by using a progress check and/or post- test.
- Provisions for easy review of selected portions of the lessons once the user has completed the mandatory portions.
- Post-tests should identify user weaknesses based on learning objectives.
- Hardware and software for both the user and developer that can support the ICW program.

Staffing

Ideally, an ICW development team is preferred over a solo developer. The team should be skilled enough and empowered to make the decisions needed to efficiently manage the development process. Due to the complex nature of ICW development, ICW development team members should be experienced and available for the duration of the project. ICW development is an art as well as a technical skill. Significant time investment is required by both the organization and the ICW developer to learn the skills needed to create effective, dynamic ICW products. For that reason we recommend that you select ICW development personnel who can remain on the team for multiple projects instead of trying to build new teams for each project. Individual team roles are identified on the following page. However, many of the roles and responsibilities are typically filled by the same team members if the project/ICW workload is low. Your individual resource environment will dictate how these roles and responsibilities are divided.

ICW Development - Staffing (continued)

Staffing Responsibilities The following table shows the general responsibilities for a development team

.Roles	Responsibilities
Sponsor	Authorizes development/provides funding, needs analysis, delineates desired performance objectives and provides subject matter expert (SME).
External Project Manager	Supervises project from inception to delivery. Ensures needs analysis is completed, resources are available, monitors team performance and end-user satisfaction.
Instructional Designer	Designs and/or develops ICW products.
Subject Matter Expert	Provides necessary technical content information.
Writer	Writes text and assists the instructional designer in development of ICW scripts. team.
Editor	Review products for consistency, clarity, usability, and ability to meet desired goals.
Data Entry Specialist	Enters script into authoring system.
Programmer	Writes executable code or runs the authoring system; assists other team members in creation of content that can be executed by the authoring system.
Media Expert	Prepares audio and visual material. Helps other team members select appropriate media for specific applications.
Graphics Designer	Prepares visual layouts for the ICW product. Helps other team members select appropriate graphics that best support the desired learning objectives.
Learner/Evaluator	ICW product end user. Ideally a "typical" trainee who can complete the program and provide feedback to the development team.
Product Administrator	Copies, ships, and receives ICW products and related material.
CBT Administrator	Oversees field use and appropriate distribution via the sponsor.
Information Resource Manager	Computer network software/hardware specialist.

Privacy Act Statement User requests for personal data must be handled in accordance with privacy act regulations.

Feedback

Purpose	Feedback helps to keep the student's interest, provides additional information, and responds to student inputs.
Acknowledgment	Whenever the student makes an input, whether correct or incorrect, the input must be acknowledged. You can beep, show button pushed or show switch movement. Give the student the option of turning the sound on or off.
Positive Feedback	All feedback should be positive and kept as short as possible, yet provide enough information to point the student in the right direction. It is also important to keep all feedback in context with what was presented.
Informative Feedback	Informative feedback indicates the correctness or incorrectness of a given answer. The following are examples of good and poor informative feedback.

Poor Feedback	Sorry, b is incorrect	This indicates that "b" is incorrect but it forces the student to continue guessing until the correct answer is found
Good Feedback	Sorry, b is incorrect. The correct answer is a.	This shows the student the answer chosen and also shows the correct answer. This method shows the student the error and at the same time eliminates guessing to find the correct answer.

Figure 10

Feedback (Continued)

Positive Feedback (continued)	An even better way to provide feedback is a combination of both positive and informative feedback. This involves allowing the student to make two wrong attempts before indicating the expected response. Sometimes, we inadvertently choose the wrong answer. This option does not penalize one for being human.
Repeating the Prompt	If the student selected the wrong answer the first time, repeating the same prompt does nothing. This is especially true if the student is unsure of the correct response. The prompt should be reworded, possibly revealing more information or additional guidance.
Consistency	Feedback should be in the same place every time and whenever possible the same type. Do not use text one time and a graphic the next.

Remediation

Definition	Remediation is information provided to a student to correct misconceptions, fill memory lapses, or add to incomplete learning.
Purpose	Remediation provides an opportunity for the student to get additional information for an incorrect response or incorrect procedure performance.
Remediation as an Option	If you are using remediation, always make it optional for the student. Forced remediation for an incorrect choice almost always adds to the frustration level. Would you like to review the lesson? Would you like to repeat the exercise?
Timing	Exercise caution when using remediation. It is best to allow the student to answer all questions/exercises prior to asking if they want remediation. Having the remediation prompt question appear every time an incorrect answer is chosen can be frustrating.
Remediation Content	If a student did not gain a proper understanding the first time through the material, more than likely, repeating the same information will not help. It is best to reword, rephrase or go into more detail in the remediation. Always keep the remediation in context with material originally presented.

Appropriate Practice

Appropriate practice refers to the use of skills and knowledge that the student will require when performing and supporting the objective. For students, this will include selecting control settings, analyzing situations, making decisions, and taking corrective actions. The following items are benefits of appropriate practice:

- Practice provides an opportunity to use skills and knowledge prior to testing.
- Practice items provide a source of dynamic interaction that is not possible in other media.
- By performing, the student can see where more practice is needed.
- Practice exercises are accompanied by help and remediation information.
- Practice quizzes usually suspend the help function but provide the option of remediation upon completion.

When developing practice opportunities for the student, the instructional designer should consider *HOW* the student will be interacting with the computer while engaged in ICW practice sessions. One facet of that interaction is understanding **Input Controls.**

Practice (Continued)

Action Prompt	An action prompt is a statement or phrase that lets the student know that an action is expected. Without this kind of information, the student may think the machine has locked up. It is a common occurrence to find courseware frames that expect an action from a student but do not have a clear direction for the student to perform. When having the student answer a multiple choice question, provide a statement as to how the input is to be made.
Example	An example for procedures would be to provide a message in all caps in the lower right hand corner of screen to perform action, *(i.e., "TYPE RESPONSE NOW.")* Placing this cue where the next icon or arrow would be located further serves to reinforce the action prompt.
Realistic Examples and Values	Selection of actual examples and values that a student is likely to encounter helps to provide a general understanding and positive transfer of training. For example, *the use of latitude and longitude for nautical navigation should start with coordinates that the student will be using immediately.*
Simple to Complex	Allow for a steady progression of increasing complexity or difficulty in a task. If a change in difficulty is too great, the student should have the opportunity to return to an easier task or receive additional prompting.

Practice for Procedures

Here are key points for demonstrating and providing practice for procedures.

- Write the name of the procedure as a lead-in to the steps.
- Show a demonstration of the procedure.
- Include all display changes, auditory tones, control inputs, etc.
- If a step involves a decision, state each decision as a separate step.
- For complex procedures, progressively list each step as it is
- demonstrated or performed. (Steps should be parallel and in list
- form.)
- Provide aided practice as part of the presentation segment.
- If there are common errors in performance, provide this
- information after the student has completed the practice exercise.
- Use the name of the procedure as an action prompt to initiate the
- practice sequence.
- The action prompt does not name the step to be performed. This
- feature should be found in HELP.
- Use the same location, color, and font for the action prompt.
- (Example: lower right corner, cyan, and BOLD). This combined
- set of cues will make it clear that an action is required.

Step Completion

Confirmation of a step completion is essential to good interface with the student. The following items are characteristics of a step completion:

- Provide progressive confirmation of each step as it is successfully
- completed.
- Progressively list each step as it is correctly completed.
- Provide a procedural help when the student gets stuck.
- Provide Help icon for student to voluntarily select assistance.
- Provide Help when student makes a number of incorrect inputs(we suggest two).

Automatically clear the Help when the correct input is made.

Practice (Continued)

Progress Checks for Procedures	Unaided procedure practice can be used in practice quizzes and progress checks. Make this a separate entry on the lesson index. Drop the help function for this type of practice. Inform learner if additional references are required for these progress checks (i.e., technical manuals used on the job, etc.). Provide a procedural prompt after the student misses the action twice.
Free Play Practice	Free play practice provides control-display emulation of panels which allow the student to set up the simulated equipment in any manner they wish. It is suggested that this option be provided as a separate entry on the menu structure. Note: *While freeplay provides an effective learning process, it is costly* *to develop in regard to labor and resources.*
Learning Strategies	Learning strategies are intended to increase the number of links between presented information and existing knowledge in order to enhance retention. ICW provides opportunities for learning strategies which are not available in other instructional delivery processes. Some examples of these strategies are • recall • integration • organization • elaboration Some ICW tools to facilitate learning strategies are: pull down menus, drag and drop, multiple choice, immediate feedback. Learning strategies and styles are a broad subject of study. The reader is advised to seek further guidance in this area. Suggested references are found in the appendix of this document.

Overall Design

General

This section will help you decide where to place your title, text, graphics, navigation icons, and any other lesson information. The educational message should be relayed at the first glance of the student on every screen. The lesson layout should be kept simple for maximum impact. When practical, these layouts should remain consistent throughout your lesson. The following concepts may help you in basic layout design.

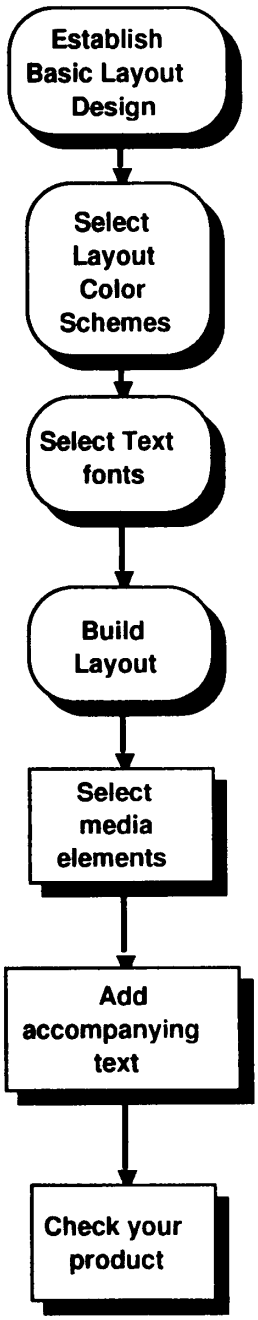
Consistency

Consistency is a key goal for the ICW designer and developer. Strive for consistent architecture, video and graphics screen composition, student interaction with the courseware, screen color schemes, testing strategies, and other courseware design conventions. While it is most important to maintain consistency within a given course of instruction, consistency between courses presented on the same device is also important. Following the principals in this style guide should help you create products that meet these criteria.

Design Elements

Design elements are object size, color, and text styles. Ensure each element has been given careful thought for message transmission and aesthetics. Remember to treat text as a visual graphic.

Design Process Model



Student Scanning Students read in a "Z" pattern. Generally, students will scan the screen in this same way, unless color or size have drawn their attention elsewhere.

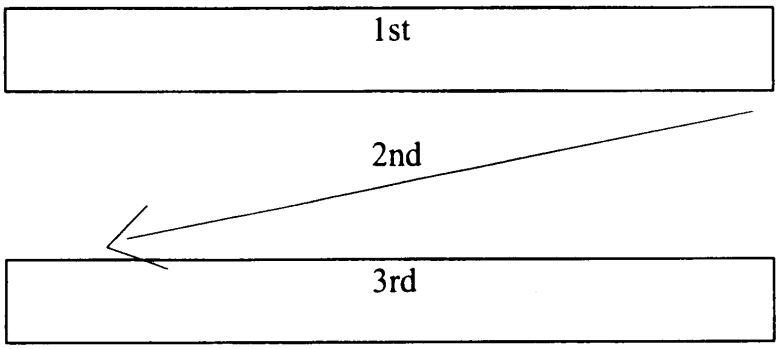
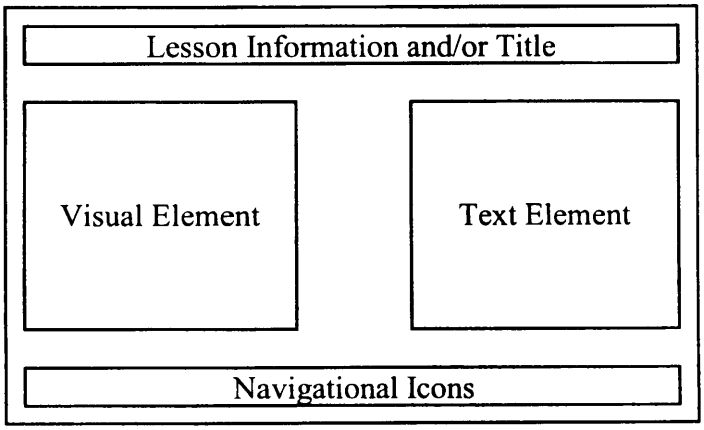
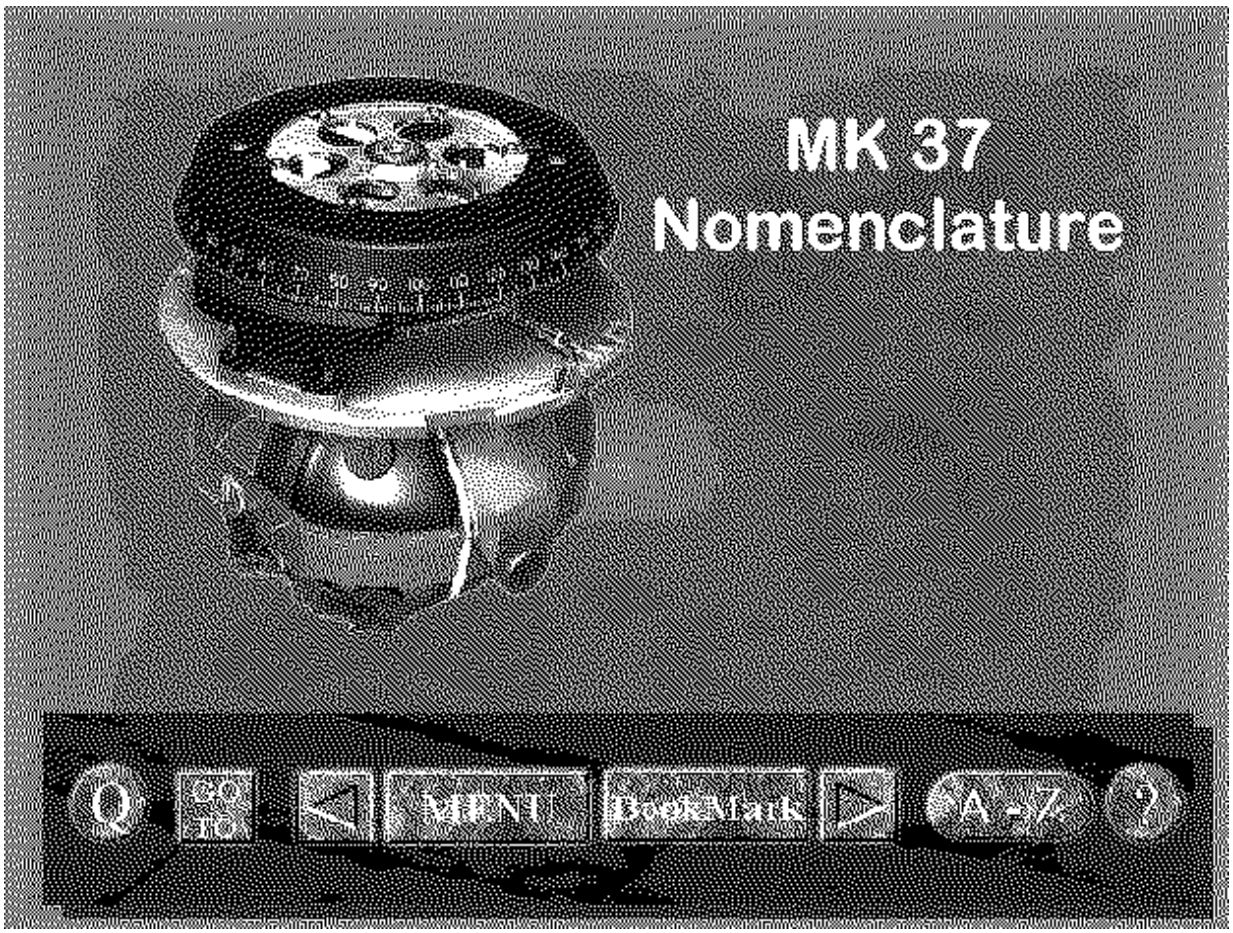


Figure 1

Screen Division For a basic lesson, divide your screen into the four areas as shown below.



Information Location	The primary message element (text, graphics, video, etc.) should be on the left side of the screen. The secondary or supplemental material should be on the right.
Navigation	When navigation icons are on the screen, they should placed at the bottom or the bottom right of the screen. (Refer to the figure below.)
Other Information	Less important information, such as lesson title, should be placed at the top in an inconspicuous color and size.



Color

General

The amount and variety of colors on the screen make a big difference in how people view the lesson.

Amount

Generally, you should use four or fewer colors per screen. Of course, more colors can be used to provide realism in graphics.

Screen Depth

When possible, screen depth should be set for thousands of colors in both the operating system settings and the authoring software settings. This will eliminate erratic color changes and shifts during your project. If choosing thousands is not possible, ensure that a standardized color palette is used throughout your project.

Color Messages

Choose colors wisely. Certain colors carry special meanings in our society. For example,

- Green = go, passive, peaceful
- Yellow = caution, slow down, or lock out
- Red = stop, warning, danger

Color can also be used in an unnatural way to give a special effect. For example,

- Blue spaghetti
- Yellow coffee
- Purple ketchup

Color Combinations and Contrast

Certain color combinations do not work well on a computer screen. For example,

- red-green
- orange-blue
- fuchsia and any color

Use contrasting combinations. For example, white text on a medium to dark blue background is easy to read. Black text on a gray background is also a good combination. Blue text on a blue background
is much harder to read.

Fonts

Types	Font types should be carefully selected. For standard text use fonts that are legible (Arial, New Times Roman, etc.). For each lesson use three or fewer fonts. Use one font for headings and titles and another for text messages. Versatility can be achieved by varying the amount of size rather than choosing a new font. Some fonts are better for headlines - they are called sans serif fonts like Arial. Other fonts are better for body text. They are called serif fonts like New Times Roman. Ensure font and size selections are appropriate for on-screen reading.
San Serif Fonts (Arial)	San serif fonts are good for headlines.
Serif Fonts (Times New Roman)	Serif fonts (Times New Roman) are good for body text. They are easier to read because the curly flourishes on the letters lead the reader's eye along through the text.
Style	The style of a font can contribute a certain message of its own (**bold**, larger, *italics*, etc.). Use style to convey a message only when needed.

Text

Value Added

Ensure that the text written is of value and not just filler. If text is necessary, ensure that you put as much information into as few words as possible. Pick individual words that give the most information.

Language Use

The following attributes should be used with text:

- Use active voice and present tense.
- Avoid the use of pronouns.
- Use short, simple, or bullet type statements.
- Use concrete nouns, positive statements, and common vocabulary.
- Use inoffensive, non-sexist language.
- Define new terms the first time they are used.
- Use a glossary if there are several new terms.

Examples & Non-examples

The following chart shows examples and non-examples of language use.

Example	Non-example
Active Voice/Present Tense Jim is painting the garage.	**Passive Voice** The garage is being painted by Jim. The Garage was painted by Jim
Concrete Paper, blue, boy	**Abstract** Freedom. Peace, love
Positive Turn the light switch on.	**Negative** Turn the light switch not to the off position.
Common Vocabulary /Single Syllable must Go to bed.	**Uncommon Vocabulary /Multi-Syllable** incumbent upon Travel to the point of repose

Text (Continued)

Acronyms

Avoid the use of acronyms, abbreviations, and jargon. If you need to use acronyms, provide a glossary with the complete meaning.

- Use technical terms and abbreviations as they occur on equipment (example "EMER BST ON")
- Capitalize whenever you refer to a switch position(example "ADF switch-UHF1")
- Technical phrases rather than jargon (example "Emergency
- Jettison Button" instead of "Panic Button")

Emphasis

To emphasize text, use effects such as bold, italics, shadow or change the font size or color. Red and yellow can be used for emphasis of small portions of text. You should not use all red or yellow text, even though it looks

- good on a dark background.
- You should not use underlined text.

You should not use flashing text unless it is simulating equipment indications.

Capitalization

Use a mixture of upper and lower case letters. Always CAPITALIZE switch/component names, or follow the terms and abbreviations used on the equipment. Avoid using capitalization at other times.

Text Display

Use six or fewer lines of text per screen. Each line should contain no more than six words. Use justification, spacing, border size, and text box design to make the text appealing.

Humor

Be careful in using humor. Humor used in the correct way can maintain audience interest. You have to know your audience well in order to be successful without being offensive. The bottom line is to be professional with your humor if it is used at all.

Media Elements

Media Elements

Media elements are used to convey information outside of text. They include:

- Computer generated graphics (two or three dimensional)
- Photographs in a variety of formats (pict, TIFF, bit map, etc.)
- Computer generated graphics (two or three dimensional)
- Video/animation formats (Quick Time (mov), MPEG, AVI, DIB, etc.)
- Audio formats (wav, au, aiff, pcm, mid, etc.)

Media Selection

You should seek the guidance of an instructional technology specialist or media specialist for media selection. Here are some general rules of thumb.

Graphics/photos - the old adage "a picture is worth a thousand words" is just as true in interactive courseware. Graphics can be used to enhance the transfer of learning by providing a clear, succinct presentation of
the lesson objectives.

Audio - narration can be used to appeal to a learner's auditory senses. In fact, some people prefer and learn better from listening to a narration of the key points of the lesson.

Video/animation - used to show actual performance or to simulate complex functions and principles.

Use of Visuals

When employing visual elements, ensure the visual:

- Is necessary to convey the image
- Is large enough to see pertinent information
- Has sufficient detail to see pertinent information
- Ensures color is realistic and used to focus attention or convey
- meaning
- Supports other elements on the screen
- Is not cluttered with unnecessary details

Media Elements (Continued)

Photos/Graphics

Whenever possible, use a graphic in place of a photo. If a photo is absolutely needed, then use a digitized photograph that has proper lighting, angle, focus and scale. Graphics and photographs should be designed to run/display using thousands of colors or standardized color palettes if possible. Otherwise use the same color palette for all graphics.

Video/Animations

The learner should control initiating video and animation sequences and should have the option of repeating them. Video and animations should be large enough to effectively convey information. Be aware that high quality video files require large amounts of hard disk space.

Audio

Audio should always complement the text and visuals. Audio should not include extraneous information, unwanted sounds or inappropriate pauses. Narration should be attractive, credible and engaging with appropriate volume, pace and tone. Narration should not mimic the text. Be aware that large, high quality audio requires large amounts of hard disk space. You should use a professional narrator. Professional voices add the correct emphasis and interest to the narration. Approximately seven seconds of narration is the maximum recommended for a single piece of narration. Chunking sound is just as important as chunking text.

Media Management

Create libraries (see glossary) of your media elements for each project. This organizes content and conserves disk space for multimedia projects.

Use a consistent naming convention for media elements. For example:

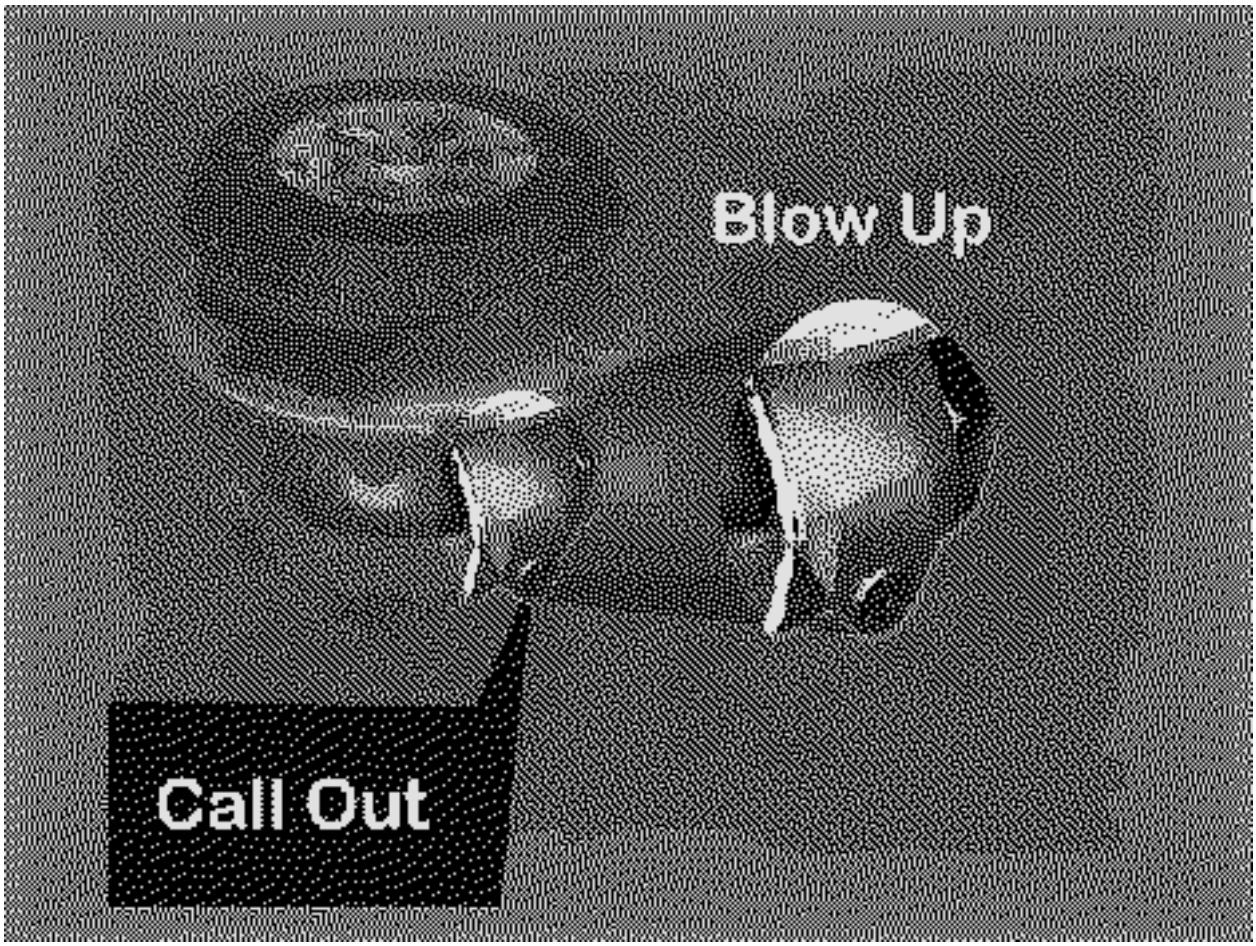
softleft_Pb - is a push-button
sec5_Timer - is a 5 second timer
rpm_Ind - is an RPM indicator
volume_Sw - is a volume switch

Text files of spoken audio clips should be maintained for later revisions.

Media Elements (Continued)

Points of Interest

Use call outs or blow ups to point out areas of interest. The following illustrations show examples of call outs and blow ups.



Some Simple Checks

Screen Layout

- ✓ Are the screens cluttered or too "busy"?
- ✓ Is it easy to see how the information on the screen is organized?
- ✓ Are the colors and graphics used in the basic layout attractive and not distracting?
- ✓ Are the screens of the course consistent and easily used?

Color

- ✓ Are four or fewer colors used for your layouts?
- ✓ Have you used colors wisely and consistently?
- ✓ Do your backgrounds and major
- ✓ visual elements have sufficient contrast?

Fonts

- ✓ Are the fonts easily readable?
- ✓ Did you use three or fewer fonts?
- ✓ Have you used font styles (bold, italic, etc.) judiciously?

Text

- ✓ Is the language, abbreviations, and acronyms used appropriate for the target audience?
- ✓ Is the text grammatically correct and uses proper, consistent punctuation?
- ✓ Is your text short and to the point (6 lines or less)?
- ✓ Does the text support the visual elements presented?

Media

- ✓ Do the media elements used clearly enhance the learning process?
- ✓ Are the graphics too simple or too detailed?
- ✓ Is there enough animation to keep the program interesting without being distracting?

Navigation - Menu Screens

Main Navigation - Menu Screen

Most programs include a main navigation - menu screen, sometimes called an index screen, that can serve as a centralized point to navigate within or between modules/lessons. Alternate paths may exist within the program (i.e., branching based on student responses) but the main navigation - menu screen typically serves as the primary point for the learner to enter and move from module to module.

Functions

This screen usually presents all modules in their recommended sequence. Students exiting a module are typically brought back to the main menu (or given that location as an option) in case they want to select another module or lesson. Some navigation - menu screens may also include student registration/data areas.

Characteristics

Navigation - Menu screens usually have the following characteristics:

- Consistent in appearance and operation.
- Use similar formats and color for similar screens.
- Limit menu layers to two, a main index and a segment index, to ensure the course structure is obvious.
- Main and segment menus are similar in design. Each should contain navigational information and selection options.
- Main menus should contain a list of options (submenus) for the student to select from.
- Submenus should allow the student to return to the main menu. A selection button/icon should be placed on each submenu for this option.

Main Menu Content

Main menus should contain the following lesson information:

- Title (lesson name)
- Date (date lesson released)
- Segment Name (titles of segments to be reviewed)

Navigation - Menu Screens (continued)

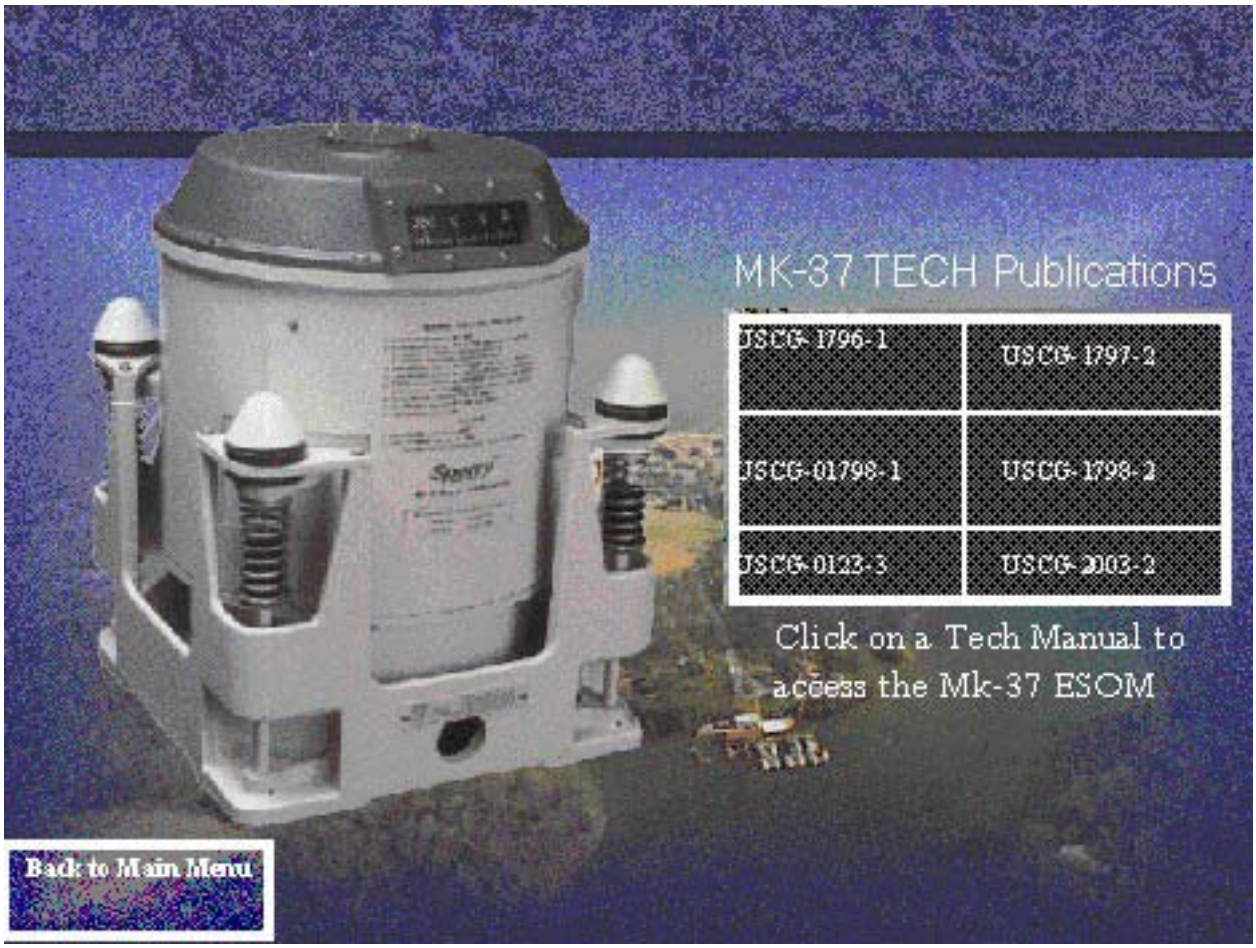
Submenu Content

Submenus allow a student to select an area within a lesson or module (i.e., "pretest"). Submenus typically have the following characteristics:

- Submenus do not usually provide an explanation of their elements since the title should be self-explanatory (i.e., "test").
- Submenus may contain some of the same items as the main menu (e.g., title, exit, help, reverse and forward buttons).
- Submenus contain items that allow students to "fast forward" through the lesson.
- Submenus allow the student to exit anytime they choose.

Examples

The following illustration shows a sample submenu.



Navigation Graphics

General Conventions

The navigation system should be consistent, intuitive, and user- friendly. This system enables the student to move within a lesson/module (i.e., screen to screen) or to perform a task within a screen. Navigation graphics are typically reused throughout a learning module and should be kept in a library to minimize storage requirements and improve run-time performance. Using a library also enables developers to modify the module more easily (i.e., change one button in a library vs. changing every button in a program). Navigation graphics usually appear in templates and screens.

Menus Vs. Buttons

Navigation icons and buttons may have similar functions as menu items (i.e., using the menu in Word to cut/paste text or using the icons on the tool bar). The developer using both systems should ensure that the buttons/icons and menu items do not work at cross-purposes. For example, if a "Back" button is disabled then the menu function that does the same job should also be disabled.

To Build or Not to Build?

Using or adapting an existing proven model or template can save the novice developer significant time and effort while boosting product quality.

Models & Templates

Templates consolidate the navigation and menu systems into a standardized display that appears throughout the program. Most effective navigation systems place their icons at the bottom of the screen in the template. By embedding the icons in a template you reduce the potential for student confusion. The navigation system becomes relatively transparent to the learners as they progress through the lesson. Reusing templates enables students to focus on content instead of spending valuable time learning how to navigate through the program. Templates are covered in greater depth in the next chapter.

Navigation Graphics (continued)

Screen Placement

Navigation systems may also rely on buttons, boxes, icons, or switches placed within the learning screen when the navigation requirement is uniquely tied to the content matter on the screen (i.e., drag and drop buttons). These buttons/icons should be placed to avoid conflict with any text, graphics, or other content matter on the screen. They are usually placed toward the bottom of the screen for navigation.

Navigation Buttons/Icons

Appearance

Use subdued colors (typically gray, beige, or a light contrasting color to the screen). Button size should be large enough to accommodate a practical size touch area (where you place the mouse) that does not overwhelm the other screen elements. Icons, buttons, or boxes should look three dimensional to differentiate them from text boxes. Use bevels, shading, contrasts, or color to create a three dimensional look. Labels are typically placed on or next to the button and if placed on the button, should be of contrasting color to the button (i.e., don't use light green text on a dark green button).

Buttons as Metaphors

Button shape, color, and function may be selected based on the lesson content's context, theme, and level of interactivity. The buttons and navigation system serve to act as supporting elements to the instruction or tap into popular/common meanings held by the typical student. Examples include using a book as a symbol for accessing a technical manual, an open door for an exit, or using a ship's bridge environment for a navigation training module.

Action

Navigation graphics should change in appearance (color or dimension) to indicate that the student has made an input. Button text should change with the button between modes.

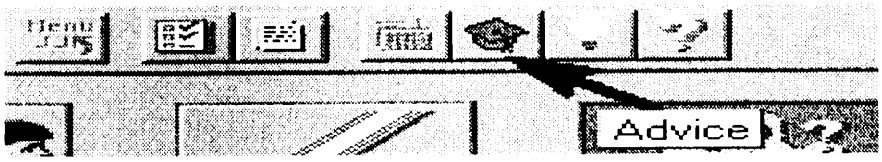
Inactivity

Inactive navigation buttons (i.e., a "back" button disabled during a test) should have a color or shading change to indicate their status.

Navigation Buttons/Icons (continued)

Balloon Labels
Tool Tips

Developers are encouraged to use context sensitive balloon help/tool tips to enable users to identify/define a navigation button's or icon's function by placing the mouse cursor over the graphic.



User Friendly

Make your lesson user friendly by including key navigation icons. Most programs, at a minimum, use exit, help, objective, and index, on each frame in addition to next (continue) and back as noted in the following illustration.

Characteristics

Buttons and icons should have the following characteristics:

- Self explanatory
- Located in the same area each time
- Produce the same results each time they are selected
- Have logical functions (no "Main Menu" button on the main menu screen)
- If an illogical button must be on the screen then gray it out as in the following illustration

Screen Transitions

Transitions from one frame or state to the next should be performed quickly and smoothly. The additional time it takes for fancy dissolves and wipes can become very annoying after only a few frames. If you choose some special effects, select ones that are fairly quick.

Examples

The following illustration shows examples of various navigation graphics.

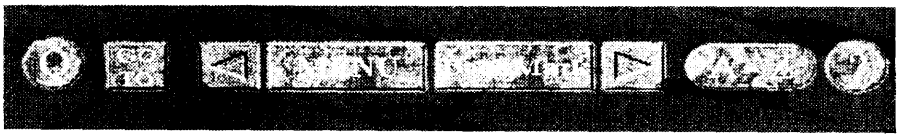


Figure 4

Navigation Buttons/Icons (continued)

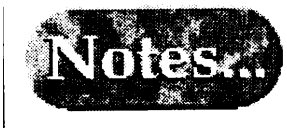
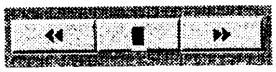
Typical Buttons

The following table lists common buttons and their uses within an ICW program.

Note: Every button/icon is not required in a program. Only use the ones that are germane to your project.

Function	Use	Button
Bookmark	Allows the student to exit the lesson and then reenter at the same place they left if not a function/subroutine of an exit/Quit button..	
Exit/Quit	Allows student to leave a lesson. It is best to have only one exit to a lesson. The exit may be tied to a bookmarking function.	
Forward, Next, or Continue	Allows student to advance one frame at a time. Usually the student should progress to the next screen by taking action (e.g., solving a problem, answering a question.	
Glossary	List any words that might be unfamiliar to students and their definition. Ideally, they should be tied to a help function/area.	
Go To...	Enables the student to dynamically access a lesson or module	
Help	Explains how to use (button/icon function) or navigate within a lesson or go to a general help area. The student should be able to access various levels of help within a lesson (Tool- Tips, Balloon Help, Hyperlinked content areas).	
How To...	Provides instruction to the student for interacting with the courseware.	

Navigation Buttons/Icons (continued)

Menu	Returns to main menu.	
Objective	Allows student to review the objectives and understand purpose of the lesson (i.e. What do I need to learn)	
Reverse	Allows student to go back one frame at a time.	
Trouble Report	Allows student to generate a text file that documents content and programmatic errors. Errors should be specifically referenced by lesson and frame number/name.	
Notes	Provides capability for student to enter, retain, and print notes tied to a particular subject matter. A popular function for learners who may not have ready access to the module at the job site.	
Play- Replay	Enables student to play or replay an animation or video clip. Should be disabled/not present unless that screen has an associated video clip	

Templates

Templates

Templates provide a framework for designers and developers to place graphics, text, and navigation buttons in a reusable system. Using a template enables you to avoid wasting time/money on building the navigation and presentation system from the ground up. It also enables a development team to work within the same framework, even though their individual efforts may be focused on different screens/modules.

Templates as Tools – A Time & Money Saver

Building your template first, or using an existing one, can greatly reduce the time needed to finish your project by driving the development team towards a more focused development approach. Here are a few reasons why:

- Text. Writers know how much text they can place on an individual screen (since the template shows how much area is available) instead of simply writing out all of the text for a particular topic --- forcing a developer to chunk it out later on.

- **Graphics & Media**. Graphics designers can appropriately size images, pictures, and other media to fit the screen area/color scheme of the template. Again, a time/money saver if done up front.

- **Navigation**. The development team can focus their efforts in building appropriate content/learning interactions instead of creating the navigation system as they go.

Uniformity. Reusing templates throughout several programs enables the student to learn the basic navigation and presentation system once and then carry forward their knowledge to the next module or program. A good reusable template enables the student to focus on the *content* (the message) and not on the presentation *system* (the media).

Templates (continued)

Templates as Tools - (continued)

- **Maintenance**. Templates, especially when used in conjunction with models, can make it easier to maintain an ICW course over its life-cycle. Personnel charged with maintaining the course can focus more on needed content changes and less on understanding how the learning interactions, navigation systems, and presentation displays were created.

Use

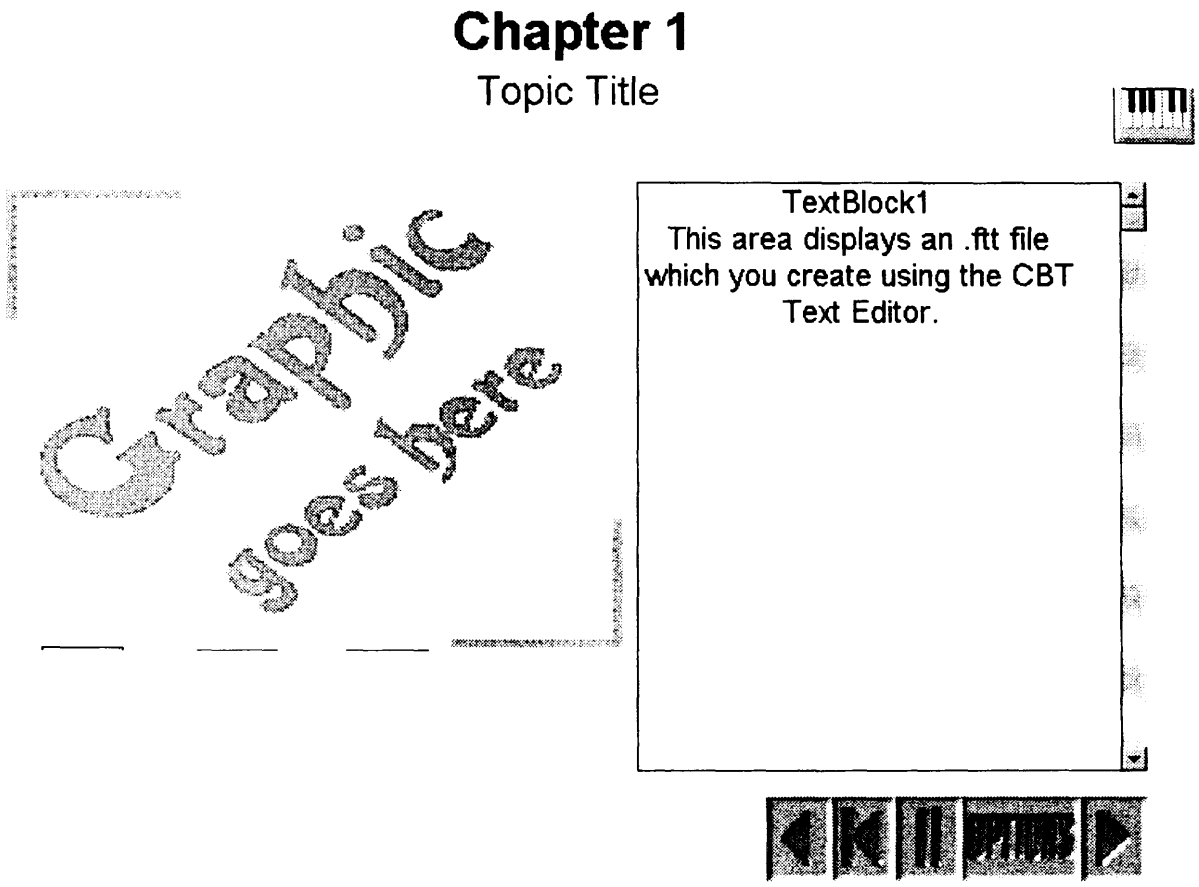
Once you have developed a design that works well, it is useful to capture main elements into a template format for reuse. This will reduce production time for future courseware and enable consistency in lesson designs. Designers and developers are encouraged to share templates with other Coast Guard organizations and development teams.

Note: Authorware Model System if procured prior to publication.

Examples

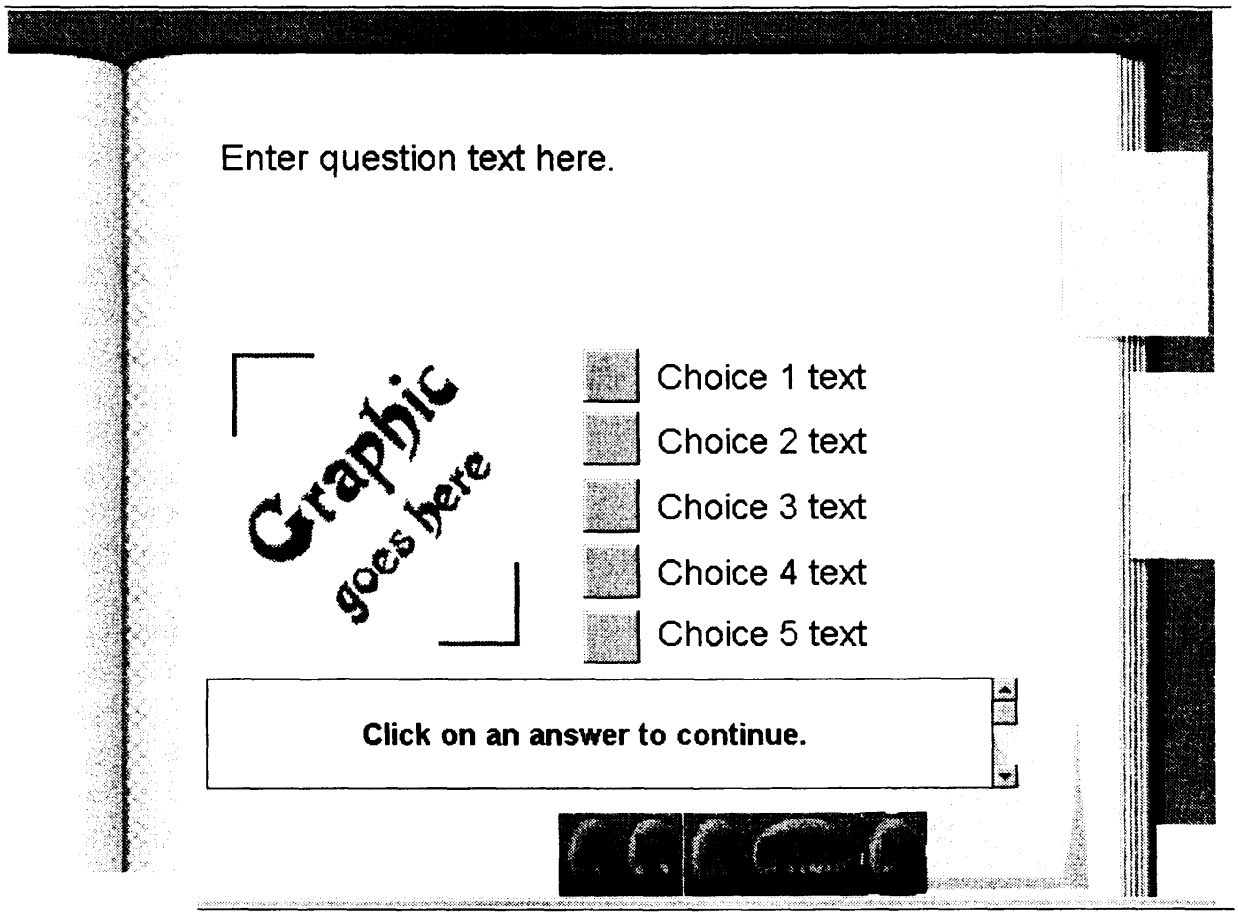
Templates can be in the form of entire lesson shells, demonstration shells, testing shells, navigation, or logic operations. The following illustrations are some graphic representations of templates.

Example 1


Chapter 1
Topic Title
Graphic goes here
TextBlock1
This area displays an .ftt file which you create using the CBT Text Editor.

Templates (Continued)

Example 2



Learner Control

Do I Need Learner Control?

Students learn best when they are actively engaged in the learning process. You can build in that engagement by enabling the student to control, at least in part, their progression through a training program.

Screen Control

Let the student have control over when the next screen gets displayed. A timed overlay (the next screen appears after a predetermined time) should not be used due to various reading rates. However, avoid using "next" throughout the program. It is usually better to move from one screen to the next by having the student complete an action or a task.

Review

Give students the option to review previous material whenever possible. If a student is in segment 2 and wishes to review something in segment 1, having an icon that says "seg 1" or "menu" will enable the student to return/review a previous screen. The forward button on your screen should allow the student to advance all the way to the end of a segment if desired. You may want to prohibit reviews or movement between screens during a test or performance exercise, although reviewing *after* the exercise is usually desirable.

Touch Zones (Hot Areas/Spots)

Ensure that touch zones, or hot areas, are self explanatory. Don't make the student have to guess where to touch or what to click on. You could show touch zones on a separate Help screen if you choose. The screen should enable the learner to easily determine where the hot areas are. You can do this with color (blue text for a hot word), shape (a button), or by changing the cursor shape (from a pointer to a hand).

Bookmarks

Bookmarks are good functions to include with training programs that include multiple lessons or modules. Bookmarking enables the student to exit the lesson and then reenter the lesson at the same place. They are especially crucial for students who may be called away from the learning center to stand a watch or respond to an emergency. Try to let your student return to the same lesson segment if desired. Forcing them to repeat the segment can lead to frustration and dissatisfaction.

Learner Control (continued)

Location

The student should always know where they are in a lesson. The Lesson Information bar should include information needed to know what lesson the student is in, what segment the student is reviewing and what page the student is on

.

Help

General

The student should always be able to obtain assistance by selecting a *help* function. The following characteristics should be in your Help function:

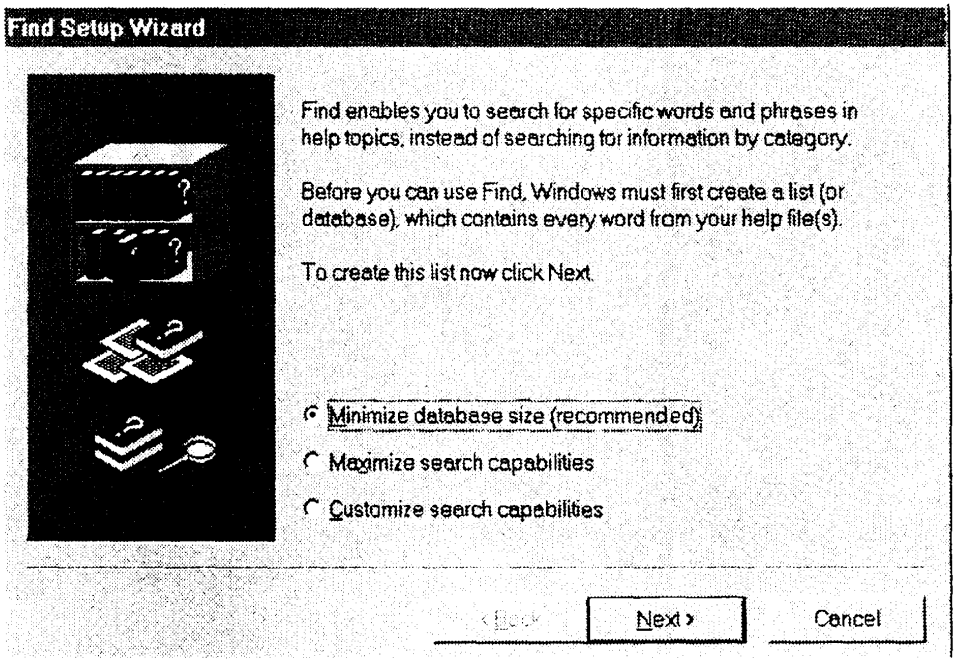
- The information must be complete, easy to access, and easy to understand.
- The help must return the student to the exact same point in the lesson from where the request was initiated.
- In the case of procedural help, the correct control input should clear the help and advance the procedure to the next step.
- A function key or a help icon can be used to provide help to the student.
- Help icons and buttons should be consistent across all lessons and courseware that the student will use.

It is not necessary to assign both icons and function keys to perform the same tasks.

Help (continued)

Wizards

Wizards step you through a task-- helping you understand what is required, guiding you through the decisions you need to make, and then executing the software to automatically create the results you want. Following is an example of a wizard



Fixed Format Help

The fixed format type of help is easy to design and always provides the same information regardless of where the student is currently working in the course. Here are some examples of fixed format help.

- Objectives
- Glossary
- Key functions
- Alphabetical help lists
- Touch/Hot zones

Testing

Introductory Screens	Provide an initial screen at the beginning of a test that states the number of test items and the estimated time for test completion. Provide an escape option for anyone who wants to "back out" at this point.
Escape	Allow an out to bypass testing. When students have progressed far enough to determine that they are wasting their time, they should be allowed to escape.
Test Results	At the very least show items that were missed. Students may recall wrong answers as correct if this is not done. Consider reviewing wrong items showing the wrong answer selected along with the correct answer.

Testing (continued)

Pitfalls

Several types of responses are inappropriate. Avoid the following when possible:

Response	Reason to Avoid
None of the above	This implies that there is a correct answer that is not given. When the answer is keyed as correct, there is no way to determine if the student is thinking of the same correct answer as the designer.
All of the above	When directed to select the "best" answer, then "all of the above" cannot logically be chosen. Students in a hurry tend to read the first correct answer and stop.
True/False	Similar to none of the above, half of the answers should answers should be false. A student selecting false may have a different idea of what is correct than the test writer.
Negatively worded test items	When necessary, capitalize the negative terms and underline them (NOT, CANNOT, etc.)

Completion

Write completion items so that only one word, phrase or value completes the sentence. Placing the blank near the end of the sentence makes it easier to read.

Example and Nonexample

The following are examples and nonexamples of completion items.

Example	Nonexample
The bridge crosses the _____ river. The Sky is the color _____.	The _____ river runs under the bridge. _____ is the color of the sky.

Types of Tests

Introduction

Placement of tests in a module of ICW serves several purposes while the formats of tests can serve to assess different types of learning.

Placement Types

Pretests used at the beginning of a module collect information about the user such as prior knowledge of the material, learning style and preferences.

Progress checks within a module or lesson indicate whether the user is learning the material as intended. This information can be used by the program to provide guidance to the user or branch the user to an appropriate section. The progress check may simply inform the user of how he or she is doing and then let the user choose what to do next.

Post-tests are used at the end of a module to certify the user has reached a specific level of proficiency. Post-test answers need to be "trapped" so that the data are recoverable.

Types of Tests (continued)

Testing Types

The following table explains the type of test and reasons why each might be used.

Type	What	Reason
Multiple choice	Example	**Well recognized**
Matching	Example	**Test recognition**
Fill-in	Example	**Easily constructed**
Constructed Response	Example	**Tests the depth of knowledge**
Drag and Drop	Example	**Allows for near simulation**
Constructing Concept Map	Example	**Tests concept relationships**
Graded Simulation	Example	**Allows more realistic testing**

Formative Evaluation of ICW (revise-as-you-go)

Overview

Whenever the Coast Guard develops training, or, for that matter, any intervention to improve performance, there must be some way to determine if the training (intervention) works. Is the ICW what students need to perform the tasks that make up their jobs proficiently Does the ICW contain too much or too little information Did course designers hit the mark

Old Method

The Coast Guard uses a "revise-as-you-go" (formative) evaluation approach to resident instruction. This approach may use a "murder board" of experts to try out instruction. Or, it may use a small group of students (pilot evaluation) to "test" new courses. Either way, course designers fix the deficiencies experts or students find and then field test the revised course. Research shows that the "revise-as-you-go" method has been very effective. However, there are better ways to "revise-as-you-go" (formatively) evaluate ICW.

"New" Methods"

Alternatives to 1 to 1 Methods	How it Works
Two-on-One	Two learners review instruction. As they work through the program, they discuss with each other (and the evaluator) errors and problems that arise.
Think aloud Protocols	Learners describe their thoughts (reactions, plans, ideas and confusions) to the evaluators as they proceed through the materials.
Computer Interviewing	Interviewers send questions via electronic mail to experts or learners. Or, computer-assisted data collection (CASAC) programs present questions on screens and register the answers, with or without an evaluator present (See illustration)

Formative Evaluation of ICW (revise-as-you-go) (continued)

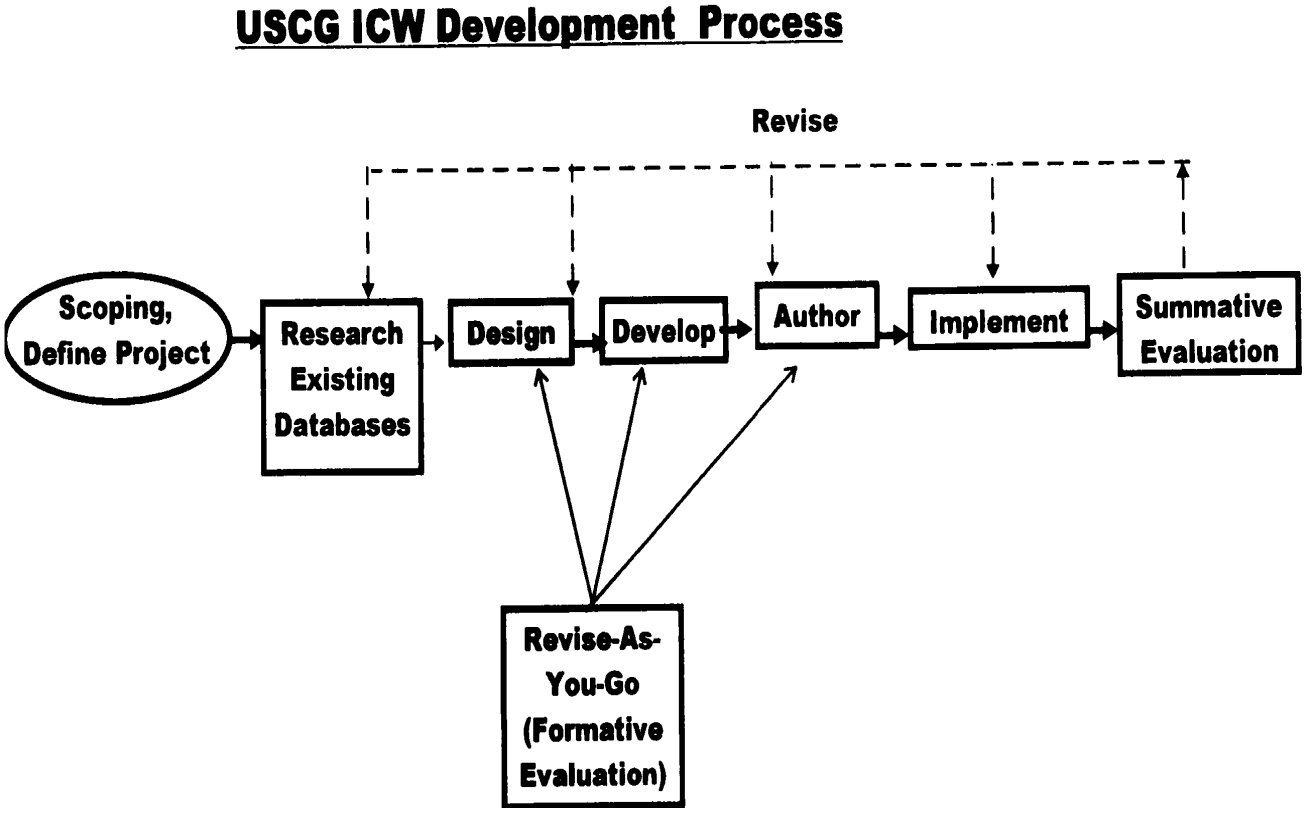
"New" Methods" (cont.)

Expert Review Methods	How it Works
Self Evaluation	The designers prepare a set of evaluation questions and criteria to evaluate the instruction, and then arrange a time to conduct the "self evaluation." Evaluation is conducted alone or with another team member acting as evaluator.
Panel Reviews	A panel review is a directed and structured group interview conducted by two or more experts. Methodology is similar to the discussion method used in the two-on-one learner evaluation. Experts and evaluator move through the instruction together. The panel discusses instruction and answers the evaluator's prepared questions.

Small Group Field Test Methods	How it Works
Evaluation Meetings	Learner groups discuss instruction without an evaluator. Then, a learner representative meets with the evaluator to discuss problems and possible changes. Based on meeting outcomes, the instruction is immediately revised and tried out on the same learner group.
Computer Journals and Networks	Individual users of networked software use the computer journal to gather evaluation data by solicitation and then store comments. Students write in their individual, on-line journals about their reactions to the software. The instructor assesses this information, and the evaluator may use the network for follow-up questions. Students (or the evaluator) can post their comments for general discussion. (e.g. Apple Open Collaboration Environment or Powertalk)
Rapid Prototyping	A working portion of the final product is developed and immediately implemented with a group of learners or experts. Their input is used to revise the prototype.

Formative Evaluation of ICW (revise-as-you-go) (continued)

:



Process

The Coast Guard ICW development process usually includes the steps and tasks outlined in this section. They are in keeping with standard industry recognized Instructional Systems Design principles and practices. However, these steps and tasks may need to be adapted based on a project's specific requirements and deliverables.

THE ICW DEVELOPMENT PROCESS

STEP/TASK	RESPONSIBILITY	ACTION/DELIVERABLE
Step 1. Predesign and Development		
Task 1	Performance Consultant	Action: Determine performance delta. Includes identification of performance gaps via appropriate analysis (e.g., FEA, new performance, job-task).
Task2	Performance Consultant	Action: Complete media analysis and selection, including appropriate media, cost-benefit and return on investment of potential media types.
Task 3	Project Team & Client	Action: Determine funding, materials needed, SME/accomplished performer requirements, deliverables, and project milestones/deadlines.
Task 4	Client	Action: Client sign-off.
Task 5	ICW Designer/Client	Action: Provide all existing instructional materials and related subject matter references and documentation. Identification of exact material to be converted is imperative.
Task 6	ICW Designer/Client	Action: Project scoping - series of meetings/activities resulting in: • Learner audience(s) defined • Course learning objectives • Course topic listing • Interactivity level specifications • Course standards
Task 7	ICW Designer/SME	Action: Look for usable products in DITIS (DOD) &commercial software databases. Ensure that materials are reviewed for content, instructional effectiveness, ease of use and other factors. Use Appendix A to this guide for the review. **IF COTS/GOTS PRODUCT IDENTIFIED, EVALUATED, & CHOSEN FOR USE, SKIP TO STEP 5.**
Task 8	Design & Development Team	Action: Select/procure design and development tools, ensure team receives appropriate training.
Task 9	Client	Action: Client sign-off.

STEP/ TASK	RESPONSIBILITY	ACTION/DELIVERABLE
Step 2. Design		
Task 1	ICW Designer	**Action**: Structure topical sequences, generate specific instructional design strategies, and define supporting graphics. Establish learner paths for each learner population. Learner testing (see Testing Section)
Task 2	ICW Designer/Client	**Action:** Review and revise structure, design, and graphics in joint meetings. **Deliverable:** • Course Design Document • Program Documentation
Task 3	Client	**Action:** Client sign-off.
Step 3. Development/Storyboarding		
Task 1	ICW Developer	**Action:** Produce scripting, storyboarding and detailed graphics; produce audio & video files; develop test questions & practice scenarios.
Task 2	ICW Developer/Client	**Action:** Review and revise text and graphics in joint meetings. **Deliverable:** • Storyboards/script • Program Documentation
Task 3	Client	**Action:** Client sign-off.
Task 4	ICW Developer/Targeted Learners/Client	**Action:** *Revise-as-you-go* (see the formative evaluation section). As components of the course are nearing a useable form, try them out on actual learners. Revise the course as necessary. (This is also called *Rapid Prototyping*).

Step 4. Authoring		
Task 1	ICW Developer	**Action**: Input to authoring system and produce graphic images and special routines. Test and debug. Be sure to test on several different delivery computers.
Task 2	ICW Developer/Client	**Action:** *Revise-as-you-go* (see formative evaluation section). Courseware review and representative learner testing.
Task 3	ICW Developer/Client	**Action:** Revise
Task 4	Client	**Action:** Client sign-off.

Step 5. Implementation		
Task 1	ICW Developer	**Action**: Package the program with documentation and explanation of student assessment. **Deliverable:** • ICW courseware • Program Documentation
Task 2	Client	**Action:** Client Sign-off.

Step 6. Evaluation		
Task 1	ICW Developer/Client	**Action**: Develop an evaluation plan. Select and plan the summative evaluation.
Task 2	Client	**Action:** Schedule and implement the summative evaluation plan. Distribute course and materials to learner. Provide list of necessary modifications/changes to ICW developer.
Task 3	ICW Developer	**Action:** Make revisions as necessary. **Deliverable:** • ICW Courseware
Task 4	Client	**Action:** Review and approval.

Appendix A

Commercial-Government
ICW "Off-the Shelf" Source Check

Overview. This sheet is designed to help you conduct commercial off-the-shelf (COTS) and government ICW product searches. The completed sheets provide evaluators with an overview of the sources and areas you've examined to try and meet a particular training need. Attach any supporting documents. Your opinions are important! Please comment on any item you feel is important or isn't adequately covered by this questionnaire. Although the checklist covers many items and areas, it is generic in nature. Some items may not apply to your project based on its goals and objectives. The cover letter provides areas for you to record product research results and SME input for the overall search. The first few entries in source information include some typical source points for these searches.

Need Info. What need/course are you trying to fill _____
_____
_____
_____

Target Audience. Who is your target audience _____
_____
_____
_____

Source Info. Where did you look and what were the results
(Some sample sources are shown.)

Source	Contact Info	Results/Recommendations/ Available for trial review?	Cost
STEP Catalog	CD-ROM or www.cnet.navy.mil/netpdtc/step/stepcat.htm /		
NETPDTC ICW	CD-ROM or | www.cnet.navy.mil/netpdtc/icw.html		
Davis Search			
Ditis Search			

SME Review. Did a subject matter expert review the proposed fill?

Product	SOURCE	SME/ICW	Recommendation

Detailed Product Review Results (complete for likely fill candidate)

Course Name/Title: _____

Product Type (e.g., CBT/CBI, online course): _____

Interactivity (graphics, animation, fidelity): High, Medium, Low: _____
_____

Min. System Requirements: _____

Predominant Instructional Strategies:

Drill & Practice: _____

Tutorial:_____

Gaming:_____

Simulation:_____

Case
study:_____

Problem analysis: _____

Other: _____

SME Review Section: Please answer each of the questions as they relate to the product you are evaluating. Indicate those questions you are unable to answer. Those questions can be addressed by an ICW developer as the checklist is completed.

Course Structure:	**Yes**	**No**	**N/A**
Start-up			
1. The course self-boots.	____	____	____
2. The course includes boot-up instructions.	____	____	____
3. Students register to use the product.	____	____	____
4. Students log on each time they use the course.	____	____	____
5. If #4 is yes, then how does the course track student & course data?			
Course ID Number? _____			
Class ID Number? _____			
Trainee Log-on Data (e.g., name, SSN, password)? _____			
Date screen? _____			
Other? _____			
6. First-time students receive a course/navigation overview	____	____	____
7. Course overview is optional for returning students.	____	____	____
8. Students can repeat the overview if desired.	____	____	____
Pretest			
9. The course includes a pretest.	____	____	____
If yes, complete questions 10 - 18			
10. Each lesson/module of the course includes a pretest.	____	____	____
If yes does the student receive the results?	____	____	
11. Students can skip the pretest and move straight to the lesson/module.	____	____	____
12. Pretest results determine a student's track through the lesson/module.	____	____	____
13. A certain score allows the student to bypass the lesson/module.	____	____	____
If yes, what percentage allows bypass? _____			
14. Students only take the pretest once.	____	____	____
15. Pretest scores are stored in a unique student data file.	____	____	____
If yes, are they recoverable and how? _____			
16. Students receive pretest instructions (e.g.,#questions, time allowed).	____	____	____
17. Students do not receive remediation or help during the pretest.	____	____	____
18. Students can review missed questions.	____	____	____
Lesson Start.			
19. Lesson start has an automatic (i.e., timed) start.	____	____	____
20. The introductory lesson has a manual (i.e., key press) start.	____	____	____

Course Structure (cont'd):	**Yes**	**No**	**N/A**
Demonstrations			
21. Does lesson provide demonstrations?	____	____	____
If yes to #21 answer questions 22-26			
22. Demonstrations are optional.	____	____	____
23. Demonstrations cover small increments of instruction.	____	____	____
24. Small demonstrations are "linked" together or form logical progressions.	____	____	____
25. Demonstrations require student interaction.	____	____	____
26. The student can pause, repeat, or skip demonstrations.	____	____	____
Simulations			
19. The simulation accurately and realistically mimics the procedure/ equipment (e.g., steps aren't skipped, are realistic, properly timed).	____	____	____
20. It contains information not included in the technical data (i.e., when/why to perform the procedure).	____	____	____
21. Simulations are directly tied to the enabling/terminal objectives.	____	____	____
22. The simulation is a mandatory lesson item.	____	____	____
23. The simulation enables the student to practice to proficiency .	____	____	____
24. Auto-prompted simulations are tailored to the student.	____	____	____
25. Sufficient interim summaries and transitional material is included.	____	____	____
26. Simulations are used to reinforce other learning activities.	____	____	____
27. Simulations are stand-alone activities and not tied to other l earning activities.	____	____	____
28. Simulations are used for testing purposes.	____	____	____
29. The simulation incorporates appropriate feedback and remediation.	____	____	____
30. Helps, hints, prompts are provided based on student activity/action.	____	____	____
Practice			
19. Practice provided until the student demonstrates required proficiency.	____	____	____
20. Simple repetition of the simulation is not used for practice.	____	____	____
21. Practice is directly tied/relevant to the enabling or terminal objectives.	____	____	____
22. Practice is timely/appropriate to the student's learning activity.	____	____	____
23. Practice questions and activities are sequenced from easy to difficult.	____	____	____
24. The program can branch the student to additional learning activities based on practice results.	____	____	____

Course Structure (cont'd):	**Yes**	**No**	**N/A**
Progress Tests			
25. Each lesson/module includes at least one progress test.	____	____	____
If yes, are progress tests unlimited?	____	____	____
26. Test/progress check questions are not repeated for the same student.	____	____	____
27. Different test questions/activities are used in the pretest and progress tests.	____	____	____
28. The program provides tailored feedback based on progress test results.	____	____	____
29. Additional training, practice and, if appropriate, outside references/sources are provided to the student as feedback.	____	____	____
30. Results can be correlated to the applicable lesson/module, and answers are stored in a test/student specific file and are recoverable.	____	____	____
31. Subject matter hints are not provided during the progress test.	____	____	____
32. Students receive feedback on their answers (correct/incorrect).	____	____	____
33. Students are provided with review/remediation based on test results.	____	____	____
34. Students and administrators can receive hard-copy progress test results.	____	____	____
Post-Test			
35. Each lesson/module has a stand-alone post-test.	____	____	____
36. Test questions, exercises, and simulations are similar in content/ format to earlier learning activities.	____	____	____
37. Test questions, exercises, and simulations are randomly generated.	____	____	____
38. Post-test attempts are limited.	____	____	____
If yes, how many? _____			
39. Scores and student test data are included in recoverable test files.	____	____	____
If yes, what data is included? _____			
40. Students are provided with test performance feedback (e.g., # right/wrong).	____	____	____
41. Students are provided with remediation, lesson repeat, or recommendations for other study/help based on their test results.	____	____	____

Course Structure (cont'd):	**Yes**	**No**	**N/A**
Critique			
42. The course includes a student critique.	____	____	____
43. Students can rate content, design, navigation, and other course elements.	____	____	____
44. Student responses, progress/test data, task data, etc. are available for recovery and analysis.	____	____	____
Course Design			
45. The course is designed to run on platforms available to the intended audience.	____	____	____
46. Course is consistent throughout in appearance and operation.	____	____	____
47. The course includes easy to use (based on intended audience/platform) bookmarks and clean entrance/exits.	____	____	____

48. Exit and entry points are frequently included.	____	____	____
49. Needless repetition is minimized.	____	____	____
50. The course will bookmark and close out if left unattended.	____	____	____
If yes, what is the waiting period? _____			
51. Students can skip, pause, and/or restart video sequences, animation, or other timed series of stills/motions.	____	____	____
52. Student review is included throughout the lesson.	____	____	____
53. Students can easily navigate throughout the modules after mandatory sections are complete.	____	____	____
If no, is there a reason to limit movement? _____			
54. Unless part of a core performance objective, students retain control regarding movement between screens.	____	____	____
55. Icons and interaction buttons are always active or change in appearance to indicate inactivity.	____	____	____
56. The course is logically organized and structured.	____	____	____
57. Students are given an overall macro view of the course (i.e., total modules).	____	____	____
58. Students are provided with typical lesson/module completion times (i.e., total modules).	____	____	____
59. Students receive a listing/organizer of each module's lessons.	____	____	____
60. Each module contains a summary screen.	____	____	____
61. Control lockout feedback is provided.	____	____	____
62. Mandatory sections and their sequence are clearly indicated.	____	____	____

Course Structure (cont'd):	**Yes**	**No**	**N/A**
Menus			
63. Menus are concise, logical, and easy to use.	____	____	____
64. Course is menu driven.	____	____	____
65. Menus reflect only those options currently available to the student via color coding, shading or some other readily apparent indicator.	____	____	____
66. Menus provide a means of cleanly exiting the course	____	____	____
67. Menu options do not function at cross-purposes to same function icons/buttons (i.e., if a move forward icon is locked out, the move forward menu item would also be locked out).	____	____	____
68. Sub-menus permit movement to higher menus.	____	____	____
69. Confirmation and feedback regarding option selections is provided.	____	____	____
70. Titles are used on all menu screens, main and sub.	____	____	____
71. Status symbols/checks are used to show students completed lessons.	____	____	____
72. Symbols/checks are used to show students mandatory/optional lessons.	____	____	____
73. Tags or indicators coupled to feedback are used to indicate recommended paths.	____	____	____
Help			
74. "Tool-Tip" type help is available at the lesson/screen level.	____	____	____
75. "Balloon Help" is available at the lesson/screen level.	____	____	____
76. "Hyperlinked" help is available at the lesson/screen level.	____	____	____
77. Appropriate help lockouts are included during testing sections.	____	____	____
78. Help menus/sections are intuitive, easy to access, and appropriate for the intended audience.	____	____	____
79. Consistent methods for obtaining help are used throughout the module.	____	____	____
80. Exiting help returns the students to the exact point in the course where they initiated the request for help.	____	____	____
81. Help information is relevant, correct, and complete.	____	____	____
82. Help includes links to varying levels of information (e.g., task specific to in-depth background information).	____	____	____
83. Help areas can be displayed adjacent to or in conjunction with the lesson screen.	____	____	____
84. Help areas are customizable and include bookmarks.	____	____	____
85. Help areas includes a search engine for word/phrase /topic searches.	____	____	____

Course Structure (cont'd):	**Yes**	**No**	**N/A**
Motivation Factors			
86. Course material is relevant to the stated objectives.	____	____	____
87. Course material is relevant to the target audience.	____	____	____
If yes, is it relevant by job/billet, rate, pay-grade, or other descriptors (i.e., age, education)? _____			
88. Course modules/lessons are short enough for students to perceive progress (typically 20-30 minutes).	____	____	____
Typical course module length is: _____			
89. Course modules/lessons are short enough for the student to easily exit and return to the same module/lesson.	____	____	____
90. Course is challenging for target audience, but not overwhelming.	____	____	____
91. Course offers the student frequent opportunities for success.	____	____	____
92. Course avoids repeating material already known to target audience.	____	____	____
93. Background material, suggestions, or directions are available for students who need additional help/refresher training.	____	____	____
94. Varying touchpoints and interactions are used to engage the student's interest and focus attention. The program avoids frequent "touch to to continue" or "next" interactions.	____	____	____
95. If used, humor is professional and appropriate to the target audience.	____	____	____
Audio			
96. Sound, if present, complements the text/visuals.	____	____	____
97. Visuals illustrate or reinforce sounds.	____	____	____
98. Key words and phrases stand out in the audio string.	____	____	____
99. Complex issues are simplified.	____	____	____
100. Audio does not include extraneous information, unwanted sounds, or inappropriate pauses.	____	____	____
101. Volume, pace, tone, and voice changes are appropriate.	____	____	____
102. Narration is attractive, credible, and engaging.	____	____	____
103. Music and background do not compete/conflict with narration for the student's attention.	____	____	____
104. Music, is used, sets the proper tone for the presentation.	____	____	____
105. Sound effects are used (e.g., Push Buttons).	____	____	____
If yes, sound effects are consistent and appropriate.	____	____	____

Testing Conventions	**Yes**	**No**	**N/A**

Testing standards and test construction may vary given the test's measurement goals.

General Standards

88. Response methods are used consistently throughout any given test. ____ ____ ____
89. Students must answer the questions in order of their presentation. ____ ____ ____
90. The program provides visual feedback to indicate which item the student has selected. ____ ____ ____
91. The student can change an answer before it is scored. ____ ____ ____
92. There are enough questions/items per learning objective. ____ ____ ____
93. The student is informed as to how many questions will be given, the approximate time needed to complete the test, and if any questions are weighted differently. ____ ____ ____
94. The student is given or has the option to select a sample question for practice prior to starting the test. ____ ____ ____
95. The student is shown the results following each test and provided the opportunity to review missed questions. ____ ____ ____
96. All scores are calculated on a 100 point scale. ____ ____ ____

Test Construction

97. Each question/problem directly relates to a performance objective. ____ ____ ____
98. Questions are concise and clear with no irrelevant words. ____ ____ ____
99. There is only one question per screen unless it is an exercise or simulation (i.e., matching). ____ ____ ____
100. Each question is independent. ____ ____ ____
101. Questions address key points. It's not a trivia test. ____ ____ ____
102. Safety related items are tested one time per type of test. ____ ____ ____
103. Information that is on an "optional" track during the program is not tested. ____ ____ ____
104. Test questions are sequended so that more difficult questions are toward the end of the test with the exception of randomly generated test questions. ____ ____ ____
105. For multiple choice, the correct answer position varies. ____ ____ ____

Design Conventions	**Yes**	**No**	**N/A**
Personnel Conventions			
106. Military personnel comply with service dress and appearance. Uniform combinations are correct and consistent throughout the production.	____	____	____
107. Actors, role players, and participants use safe procedures and comply with directives and all applicable safety rules and regulations	____	____	____
Language Conventions			
108. The program (text or narration) uses active voice.	____	____	____
109. The program uses inoffensive non-sexist language.	____	____	____
110. The tone is clear, concise, and courteous.	____	____	____
111. The program used the imperative mode with the subject understood or implied to address the student.	____	____	____
112. Sentences are short and to the point.	____	____	____
113. The program uses affirmative sentence structure whenever possible.	____	____	____
114. Abbreviations and technical jargon, if used, are common knowledge to the target audience or they are defined in the lesson.	____	____	____
115. The program does not use slang or non-technical jargon.	____	____	____
116. The student can easily look up abbreviations and technical jargon in a glossary or help section.	____	____	____
117. New terms are defined the first time they appear in a module.	____	____	____
118. Terms and definitions are consistently used throughout the program.	____	____	____
119. The program's language is appropriate for the target audience.	____	____	____
120. Sentences do not wrap over multiple screens.	____	____	____

ICW Developer Review Section: This section will generally be reviewed by an ICW developer. In addition to the questions in this section, the ICW developer will also look at those questions the SME was unable to answer.

Design Conventions	**Yes**	**No**	**N/A**
Video and Animation Conventions			
121. Courseware that requires outside media (i.e., a video clip from a CD-ROM) has a still frame that identifies the media, file, and any other information the student would need to access the media.	____	____	____
122. Videos, stills, animation, and other graphics designed to portray equipment do so accurately.	____	____	____
123. Titles, captions, or highlights over motion video, with the exception of learner control prompts, are done with video post-production techniques, not the ICW authoring system.	____	____	____
124. "Fade to black" and "up from black" are used for the end and beginning of linear video segments.	____	____	___
Navigation and Control Conventions			
125. The courseware's navigation system is consistent, intuitive, and conforms to the ICW Standards and Style guide. If no, why? _____	____	____	____
126. Navigation/interaction icons, buttons, and switches consistently use color, shading, or other visual cues to indicate position/mode.	____	____	____
127. Icons are located at the bottom of the student's screen, are consistently placed, and are consistent in their function.	____	____	____
128. Tool tips, balloon help, or other assistance exists to define icon function.	____	____	____
Switches and Control Conventions			
129. Switch/control text matches the real equipment as closely as possible.	____	____	____
130. Switch/toggle names, positions, and identifiers are legible.	____	____	____
General Conventions			
131. Displays are lean and not overly complicated.	____	____	____
132. Where needed, text is used to emphasize the visuals.	____	____	____
133. Appropriate headings are used to clarify displays.	____	____	____
134. Text or icons are not (normally) stored on video/video stills.	____	____	____
135. Where possible, split-screens are used for comparisons.	____	____	____
136. Changes between screens are limited to focus on the changed element.	____	____	____
137. Screens are systematic, consistent, and logically organized.	____	____	____
138. Each screen presents one main point, idea, concept, step, or action.	____	____	____

Design Conventions (cont'd):	**Yes**	**No**	**N/A**
General Conventions			
139. First and last screens within a lesson/module introduce and reinforce key points.	____	____	____
140. Transition screens are used to move from wide-angle to close-up view.	____	____	____
141. Transition screens are used when moving from one physical area to another.	____	____	____
142. Graphics, text, and other media work together to build a mental image/model.	____	____	____
143. Screens have sufficient "white space" to avoid overcrowding.	____	____	____
Text Design Conventions			
144. Text follows normal capitalization standards (i.e., text isn't all caps).	____	____	____
145. Text overlays are displayed on a contrasting color bar or box.	____	____	____
146. Borders are used around text bars or boxes.	____	____	____
147. The program uses consistent text format (e.g., font, spacing, color).	____	____	____
148. Consistent text and background colors differentiate types of screens.	____	____	____
149. Text is normally displayed within an area as "left justified."	____	____	____
150. Text is not underlined except to indicate a special characteristic (i.e., an active hyperlink).	____	____	____
151. Screens are not crowded with too much text. There should be no more than about 10 lines of text per screen.	____	____	____
152. Font size supports easy reading by the student.	____	____	____
153. Text columns are sufficiently wide (40-50 characters wide). Text is not in small "news columns" or in overly large columns (approx. 80 characters wide).	____	____	____
154. Full text screens, bars, or boxes are not overlaid on other text items unless they are Help overlays.	____	____	____
155. Pop-up text displays located on top of graphics can be removed.	____	____	____
Text Location Conventions			
156. Navigation text is located at the bottom of the display window or as a pull-down/pop-up menu.	____	____	____
157. Technical data notes are located in Help, pop-up windows, or as boxes in the upper right hand display area.	____	____	____
158. Safety and Warning text is displayed in Help, pop-up windows, or as boxes in the upper left hand corner of the display window.	____	____	____
159. Simulations accurately mimic real information displays.	____	____	____
160. Information text, test questions, and feedback/ re-mediation are located where best possible for the learner to see them without interfering with graphics, navigation text, warnings, or safety notices. Placement should be consistent.	____	____	____
161. Test questions and answers are differentiated by color, bullets, and/or location.	____	____	____

Design Conventions (cont'd):	**Yes**	**No**	**N/A**
Color Display Conventions			
88. The program does not use solid white, or bright color backgrounds (e.g., yellow, red).	____	____	____
89. Information is displayed as white text on a blue/ dark background.	____	____	____
90. Warnings and incorrect feedback are in red text.	____	____	____
91. Warnings and safety notices are prefaced by "WARNING" or "SAFETY".	____	____	____
92. Safety/Caution notices or information is displayed as yellow text on a black/dark background.	____	____	____
93. If used, navigation text is should be consistent with navigation icons (e.g., color, placement).	____	____	____
94. Standard color conventions are used for highlighting.	____	____	____
95. Highlighting key words in text, captions, switch names, or switch positions is minimized.	____	____	____
96. Flashing text is only used to accurately portray/ simulate equipment displays.	____	____	____
Computer-Generated Graphics			
97. Learner can control initiating animation sequences or can repeat them.	____	____	____
98. Computer graphics are limited to essential areas.	____	____	____
99. The program uses only essential ornamentation, patterns, or effects.	____	____	____
100. Graphic files are cropped and stored with associated media in a library for reuse within the program.	____	____	____
101. Program/program graphics are designed for run/ display using a 256 color palette.	____	____	____
102. Selected formats based on program needs are supportable across the organization. Currently SWS III software will support the following raster formats: (bmp, tif, gif, pcx, jpeg, tga,) as well as vector formats: (WMF, CGM, AI, EPS). [AI and EPS require postscript for output capability.}	____	____	____

Other Issues to Consider

Will the program play acceptably on SWSIII or the computers at the training site(s)? _____
_____

Will authoring tool support be required to keep the product current over its planned lifecycle?
_____
_____

Does the program include a paper-based or print-available workbook for students to keep? _____

If so, does the workbook support/match the instruction available in the program? _____

Does the program include:

An area for students to take, record, and print notes? _____

Lesson remediation (e.g., automatic, variable, # tries)? _____

Lesson branching? _____

Lesson refresher (i.e., trainee elective)? _____

Lesson assignment (i.e., progression based on testing)? _____

Date recovery (e.g., progression based on testing)? _____

Test bank database? _____

Pre-testing? _____

In-lesson test administration? _____

End-of-lesson test administration? _____

Comprehensive multi-lesson testing? _____

Appendix B

Sample ICW Statement of Work
Statement of Work for Anti-Solicitation Act Investigator Training and Financial Law Interactive Courseware (ICW)

Project Synopsis: Defense Fencing and Acupuncture Corporation (DFAC) has defined a need for the development and production of on-demand, on-the-job training materials. In part, the DFAC mission is to define the educational and training needs of the DOD Financial Management professional, and to develop and deliver the required curricula and courses to train the DOD Financial Management Workforce. The current limitation is that throughout DOD, Anti-Solicitation Act (ASA) investigators attend formal training in Fiscal Law at three military schools, but receive little or no specific standardized investigative training in investigation reporting or violations processing. Investigators are also geographically dispersed and usually come from a finance/budget/acquisition background with no initial investigative background skills. Closely related to the need for ASA training is the need for a solid grounding in the principles of fiscal law, not only for the ASA investigators but also for a wider spectrum of DOD employees. The objective of this project is to develop a two-phased training program addressing the knowledge, skills, and abilities required to perform the task of Anti-Solicitation Act violation investigations, while also providing an understanding of the relationship of Fiscal Law principles to the duties and responsibilities of personnel within the DOD workforce. The basis for formal instruction course content shall be based on DOD Financial Management Regulation Volume 14, DOD 7000.14-R (August 1,1995) and Administrative Control of Appropriations, DOD Directive 7200.1 (May 4, 1995).

The target population for the Anti-Solicitation Act component of the ICW is prospective investigating officers. These individuals could be military or civilian employees having the background and experience in the accounting, budgeting, federal acquisition, and/or financial

management policies and procedures; and ranging in rank from E-7 to E-9 or O-1 to O-10 for military personnel and GS-11 to GS-15 or SES-1 to SES-4 for civilian employees. In addition, auditors employed by the Inspector General and DOD Audit Agencies are included in the overall target training population. The target audience for the Fiscal Law training component of the ICW includes not only the Anti-Solicitation Act investigators, but an additional target audience of nearly 60,000 financial managers, accounting clerks, program analysts, management analysts, program managers, and contract managers who also require training. This additional target population encompasses grade levels GS-5 and above, as well as military E-5 and above.

General Task Description: DFAC has selected interactive courseware (ICW) via CD-ROM as the method of delivery. This ICW will be developed to address the specific issues required for investigating officers of Anti-Solicitation Act violations, and provide a detailed understanding of the basic principles of Fiscal Law. This training approach establishes the baseline for increased efficiency and effectiveness of training assets and monies, while concurrently increasing student retention of required material. In addition, it is anticipated that these core courses will also provide standardized training that can be moved to an interactive distributive training environment to reduce overall travel costs incurred by the geographical dispersion of personnel who require not only the basic training, but also follow-on training.

The contractor shall produce an ICW Electronic Performance Support System (EPSS) via CD-ROM to be used by Anti-Solicitation Act investigators in investigative techniques and procedures, six hours of instruction on Fiscal Law, and a Fiscal Law Quiz. In addition, the Contractor shall provide a written Certificate of Completion for each student who successfully completes the course, and a hardcopy Courseware Guide (a CD-ROM copy will be provided at a later date and updated as required). This program will yield several benefits in relation to student performance. When completed, it will provide for consistency of training between agencies, the increased availability of training information on demand, standardize training at geographically dispersed work sites, and provide common techniques for the students in applying proper investigative procedures throughout the Government.

Required Tasks: This effort will consist of eleven tasks, each with distinct deliverables and acceptance criteria. Refer to the table on the following page and task synopses for a breakout of the level of effort required for this program.

TASK	TASK DESCRIPTION	DELIVERABLE
Develop Media Design	Develop and document instructional design, recommend structure and treatment of each lesson	ASA/Fiscal Law Media Design Report
Develop ASA Test Items and Exercises	Develop test items, exercises, answers and incorporate SME feedback	ASA Test Items Report
Develop Fiscal Law Test Items and Exercises	Develop test items, exercises, answers and incorporate SME feedback	Fiscal Law Test Items Report
Develop ASA Script	Develop an ICW Script that integrates all course design elements into a baseline document for production and authoring	ASA ICW Script
Develop Fiscal Law Script	Develop an ICW script that integrates all course design elements into a baseline document for production and authoring	Fiscal Law Script
Produce ASA Audio and Video	Produce a master videotape and three VHS copies	Edited Master and Copies of ASA Course; Betacam master for video and audio for CD-ROM
Produce Fiscal Law Audio and Video	Produce a master videotape and three VHS copies	Edited Master and Copies of Fiscal Law Course; Betacam master for video and audio for CD-ROM
Produce ASA ICW	Produce validation courseware	Validation Courseware
Produce Fiscal Law ICW	Produce validation courseware	Validation Courseware
Validate Fiscal Law and ASA ICW	Conduct a pilot course in accordance with the Validation Plan	Validation Assessment Report
Produce Final ICW/EPSS	Produce final configuration of ICW	Final Interactive Courseware

ASA TASK SUMMARY

Task Description: A complete description of the required tasks and associated deliverables follows:

- *Task 1: Develop Media Design.* Develop and document instructional design, and recommend structure and treatment of each lesson in accordance with MIL-STD-1379D based on current training materials and relevant regulations provided as GFI. The *Media Design Report* shall detail the intended instructional design, recommended structure and treatment for each lesson, and address each lesson's relationship to the overall ICW. The *Media Design Report* shall incorporate revisions to the ASA and Fiscal Law Lesson Specification Reports, which shall be provided as GFM. Each lesson will be developed around a logically-sequenced set of objectives and will include top level flowchart illustrating the lesson's major components. The *Media Design Report* will include top level flowcharts, testing strategies, course standards and conventions,a basis for assigning media use to content items, instructional methodology for each objective, and a media analysis and treatment.

  Deliverable: ASA/Fiscal Law Media Design Report. copy of the Final Report to DFAC. Submit 36 copies of the Draft Report. The Government shall have five working days for review and comment of the draft document. DFAC and the Contractor shall then review consolidated comments. Changes that are mutually agreed to shall be incorporated into the final report. Should such changes exceed 10% of the content, impact the number of courseware hours, the design complexity assumed in this plan, or contract cost and/or schedule, the Contractor shall identify such impact under the terms of the Changes clause of the contract. Contractor shall provide 2 bound copies and 1 Microsoft Word 6.0 electronic copy of the final report

- *Task 2:* Develop ASA Test Items and Exercises. Develop test items, exercises, and answers and incorporate SME feedback. A formal test will be presented at the end of the instruction. This test will be competency-based with 100% accuracy required for successful completion. The *ASA Test Item Report* will provide test items with correct answers. The test items will test for the specific knowledge and skills identified by the enabling objectives and the specific content points from the SME interviews. The test items, including answer keys, will be validated by DFAC SMEs during the review process, based on their experience with the content, target population and the existing methods. The *ASA Test Item Report* shall include a cross reference of test items to learning objectives provided in the *Lesson Specifications Report for ASA*, which shall be provided to the Contractor as GFE.

  Deliverable: ASA Test Items Report based on the approved objectives and the final Media Design Report. Submit 36 copies of the Draft Report. The Government shall have five working days for review and comment of the draft document. DFAC and the Contractor shall then review consolidated comments. Changes that are mutually agreed to shall be incorporated into the final deliverable under Task 4, *Develop ASA Script*. Changes that are mutually agreed to shall be incorporated into the final report. Should such changes exceed 10% of the content, impact the number of courseware hours, the design complexity assumed in this plan, or contract cost and /or schedule, the Contractor shall identify such impact under the terms of the Changes clause of the contract.

- *Task 3: Develop Fiscal Law Test Items and Exercises*. Develop test items, exercises, answers and incorporate SME feedback. A formal test will be presented at the end of the instruction. This test will be competency-based with 100% accuracy required for successful completion. The *Fiscal Law Test Item Report* will provide test items with correct answers. The test items will

test for the specific knowledge and skills identified by the enabling objectives and the specific content points from the SME interviews. The test items, including answer keys, will be validated by DFAC SMEs during the review process, based on their experience with the content, target population and the existing methods. The *Fiscal Law Test Item Report* shall include a cross reference of test items to learning objectives provided in the *Lesson Specifications Report for Fiscal Law* which shall be provided to the Contractor as GFE.

Deliverable: Fiscal Law Test Items Report based on the approved objectives and the final Media Design Report. Submit 36 copies of the Draft Report. The Government shall have five working days for review and comment of the draft document. DFAC and the Contractor shall then review consolidated comments. Changes that are mutually agreed to shall be incorporated into the final deliverable under Task 4, Develop Fiscal Law Script. Should such changes exceed 10% of the content, impact the number of courseware hours, the design complexity assumed in this plan, or contract cost and /or schedule, the Contractor shall identify such impact under the terms of the Changes clause of the contract.

- *Task 4: Develop ASA Script. Develop* an ICW Script that integrates all course design elements into a baseline document for production and authoring. The script shall include descriptions of all audio, video, graphic and text elements, verbatim narration and computer text wording, descriptions of all motion and still-frame video, descriptions of all video effects and user options.

Deliverable: ASA ICW Script. The Contractor shall provide 36 copies, including one unbound and one electronic, of the review version of the script. The Government shall have five working days for review and comment of the draft document. DFAC and the Contractor shall then review consolidated comments. Changes that are mutually agreed to shall be incorporated into a final script. The Final Script shall be delivered within ten working days after changes are agreed upon. Should such changes impact the contract cost and/or schedule, the Contractor shall identify such impact under the terms of the Changes clause of the contract.

- *Task 5:* Develop Fiscal Law Script. Develop an ICW script that integrates all course design elements into a baseline document for production and authoring. The script shall include descriptions of all audio, video, graphic and text elements, verbatim narration and computer text wording, descriptions of all motion and still- frame video, descriptions of all video effects, and user options.

  Deliverable: Fiscal Law Script. The Contractor shall provide 36 copies, including one unbound and one electronic, of the review version of the script. The Government shall have five working days for review and comment of the draft document. CFAs and the Contractor shall then review consolidated comments. Changes that are mutually agreed to shall be incorporated into a final script. The final script shall be delivered within ten working days after changes are agreed upon. Should such changes impact the contract cost and/or schedule, the Contractor shall identify such impact under the terms of the Changes clause of the contract.

- *Task 6:* Produce ASA Audio and Video. Produce a master videotape and three VHS copies. The video will be shot at DFAC facilities in the Washington, DC area. The Contractor shall coordinate location access, scheduling and shooting arrangements with the COR. Locations that are selected must permit flexibility to control lighting and ambient sound, should be accessible for up to 10 hours each shooting day, and should allow production activities to occur with minimal interference to on-going operations. Any equipment, materials and supplies to be videotaped will be provided as GFE. Appropriate locations, props, and personnel to assist with properly demonstrating/illustrating the content, techniques, and procedures will be furnished as GFE. Deliverable: Edited master and copies of ASA Course; Betacam master for video and audio for CD-ROM.

- *Task 7:* Produce Fiscal Law Audio and Video. Produce master videotape and three VHS copies. The video will be shot at DFAC facilities in the Washington, DC area. The Contractor shall coordinate location access, scheduling and shooting arrangements with the COR. Locations that are selected must permit flexibility to control lighting and ambient sound, should be accessible for up to 10 hours each shooting day, and should allow production activities to occur with minimal interference to on-going operations. Any equipment, materials and supplies to be videotaped will be provided as GFE. Appropriate locations, props, and personnel to assist with properly demonstrating/illustrating the content, techniques, and procedures will be furnished as GFE.

  Deliverable: Edited master and copies of Fiscal Law; Betacam master for video and audio for CD-ROM.

- *Task 8:* Produce Fiscal Law ICW. Produce validation courseware. Upon approval of the ICW script, begin authoring the Fiscal Law lessons by converting the script information into text files and program code. Begin developing and integrating lesson-specific graphics, and encode digital audio and video files from edited master. Perform internal instructional check to ensure that all script elements have been incorporated. Perform a programming quality review. to verify that the program functions properly; that audio, text and graphics have been properly integrated; that branching, frame sequence, and transitions are accurate; and that the presentation meets the approved design documentation.

  Deliverable: Validation Courseware. Deliver courseware with a module of Fiscal Law for pilot course and a review Courseware Guide. For four days, conduct a pilot course at seven sites. This training will utilize one module of fiscal law of the courseware and will be used as a pilot course for validation activities.

- *Task 9:* Produce ASA ICW. Produce validation courseware. Upon approval of the ICW script, begin authoring the ASA lessons by converting the script information into text files and program code. Begin developing and integrating lesson-specific graphics, and encode digital audio and video files from edited master. Perform internal instructional check to ensure that all script elements have been incorporated. Perform a programming quality review to verify that the program functions properly; that audio, text and graphics have been properly integrated; that branching, frame sequence, and transitions are accurate; and that the presentation meets the approved design documentation.

  Deliverable: Validation Courseware. Deliver courseware with a module of ASA for pilot course and a review Courseware Guide. For four days, conduct a pilot course at seven sites. This training will utilize one module of ASA courseware and will be used as a pilot course for validation activities.

- *Task 10:* Validate Fiscal Law and ASA ICW. Conduct a pilot course in accordance with the Validation Plan. Write a Validation Plan for the pilot course. Conduct a pilot course consisting of one module of Fiscal Law and one module of ASA using the Review Courseware and the final Validation Plan. Assess validation results and write a Validation Report. Conduct a pilot course at the following locations: Washington, DC; Ft. Stewart, GA; Montgomery, AL; Monterey, CA; Charlottesville, VA; Philadelphia, PA; and, Columbus, OH in accordance with the Validation Plan.
  Deliverable: Validation Assessment Report

- *Task 11*: Produce Final ICW/EPSS. Produce final configuration of ICW. Deliverable: Final Interactive Courseware.

Task Schedule And Milestones: The task is scheduled to be completed 12 months after start. Progress reviews will be held each month, with an assessment status review and update occurring six months from project initiation.

Task	Start Date of Task	Scheduled End of Task	Skill Level	Period of Performance	Cost of Task
Develop Media Design	TBD	TBD	Senior Designer	58 Days	TBD
Develop ASA Test Items and Exercises	TBD	TBD	Senior Designer	29 Days	TBD
Develop Fiscal Law Test Items and Exercises	TBD	TBD	Senior Designer	40 Days	TBD
Develop ASA Script	TBD	TBD	Senior Designer	40 Days	
Develop Fiscal Law Script					

Task Deliverables: The contractor shall provide the following data deliverables IAW the contract schedule and CDRL instructions:

CLIN XXXXX, CDRL A001, Performance and Cost Report

CLIN XXXXX, CDRL A002, Technical Report-Study and Services

CLIN XXXXX, CDRL A003, Contract Summary Report

Travel Required: It is anticipated that this task will require travel to obtain information and validate the courseware. The following is an estimate of travel required to be performed in executing the above tasks.

DESTINATION	NUMBER OF TRAVELERS	NUMBER OF TRIPS	NUMBER OF DAYS	PURPOSE
Washington DC	2	30	1	Coordination of project and obtaining GFE/GFI, plus production development
Ft Stewart, GA	2	1	4	Validation
Montgomery, AL	2	1	4	Validation
Charlottesville, VA	2	1	4	Validation
Philadelphia, PA	2	1	4	Validation
Columbus, OH	2	1	4	Validation

Security Requirements: There are no security requirements for execution and completion of this task.

GFE/GFI: The Government will furnish all required materials and documentation associated with ASA and Fiscal Law necessary to develop and complete the identified courseware modules.

Special Requirements: The contractor will have access to Government-owned computers, copiers, telefax, and telephone services/equipment while working on-site.

Appendix C

ICW Contract Vehicle Matrix

Contract Vehicle	User Agencies	Ceiling /Expiration	Contract Type	Usage Fee	Processing Time	Order Limits
DOT-ITOP	DOT/All Federal	$1.13B (5/2003)	Cost Plus Fixed Fee (CPFF) and Firm Fixed Price (FFP)	1-4%	4 Weeks	$30L to $50M
DISA/DEIS II	All Federal	$3.0B (7/2001)	Time & Materials (T&M)	2%	4-6 Weeks	$100K Min/No Max
NIH (CIOSP)	All Federal	$100M (9/2001)	T&M	1%	14-21 Days	N/A
E/TSTC NSWC PHD Dam Neck	All Federal	$50M	CPFF	1%	4 Weeks	$6.6M/Year
Army Multimedia Contracts	All Federal	$10M/ 04/99	FFP	3-5.5%	4-6 Weeks	None
FAA/Crown Communications	All Federal	$10M/ 10/2000	FFP	17%	4-6 Weeks	None
NAWC TSD	All Federal	$1B/10/99	FFP	3-5.5%	4 Weeks	None
OPM-TMA	All Federal	None/2001	FFP	15%	1 Week	None
MFAC	USCG/R&D Center	$90M/8/99h	Time & Cost Plus	0	TBD	None
SPAWAR Support Contract	All Federal	Base Period: 12/8/95-9/30/96 4 one year options	Cost Plus Award Fee	Call for Current Rate	4 Weeks	None
VOLPE-National Transportation Systems Center	DOT; All Federal	N/A; VOLPE is a DOT Fee-For-Service professional services institute	Time & Material Task Orders	Call for Current Rate	1-2 Weeks	None

Appendix D

Contract Vehicle Profiles

Army Multimedia Contract

Contract No. & Name	Army Multimedia Contract; DABT60-93-D-0012
Contract Type	ID/IQ-Firm-Fixed Price
Period of Performance	Base Period: TBD
Contracting Agency	U.S. Army Training Support Center ATTN: ATIC-ETO-S, Bldg., 1557 Fort Eustis, VA 23604-5168
Contracting Officer	Mary A. Carpenter (757) 878-3608 Barbara Ann Helser (757) 878-3608
COTR	TBD
Authorized Users	All Federal Agencies
Contract Min & Max	Min: None Max: None
Contract Rates	Available on request
Admin/Handling Fee	5.5%; Call for current rate
Funding Limitations	Unknown
General Scope	Distance Learning, Training System Courseware, Analysis and Training Management, Video teletraining support packages, Instructional Systems R&D
Prime Contractor	• Carley Corporation • Logicon Eagle Technology • Professional Software Engineering, Inc.

Contract Vehicle Summaries (continued)

DEIS II

Contract No. & Name	DEIS II; Prime Contract No. **TBD**
Contract Type	ID/IQ-Time & Material Task Orders
Period of Performance	Base Period: TBD
Contracting Agency	Defense Information Systems Agency (DISA) 701 S. Courthouse Rd Arlington, VA 22204
Contracting Officer	Joyce Milner: (703) 573-1378
COTR	TBD
Authorized Users	All DoD and component agencies; all Federal Agencies
Contract Min & Max	Min: TBD Max: $3.0 B (total for all prime contracts)
Contract Rates	Currently all SITE rates-work to performed in either CSC or Government facilities. 44 labor categories proposed
Funding Limitations	Unknown
General Scope	Provide operations support and technical and technical expertise to SWC and TENCAP programs in planning and programming for the integration and use of DoD Space NS, and SAR programs within all Air Force mission areas. Limited support to the Space Applications Program Office located at SMC/XRS Los Angeles AFB, CA may be required. SWC efforts will support all MAJCOM and component responsibilities. The effort will be directed towards but not be limited to supporting development and evaluation of prototype systems to determine potential operational utility; improving the efficiency of collection management and system tasking support of military operations; increasing the frequency, realism and scope of exercises and training with Space and NS capabilities; developing analytical capabilities, including procurement of hardware and software for assessing the value-added of space systems in support to military operations with emphasis on air operations; education and training activities including war games; supporting efforts to influence the tactical utility of future Space and NS assets; and providing detailed support for Real World contingencies, exercises, and demonstrations of Space & NS capabilities at all levels of command
Subcontractors	Aerojet, Autometric, BDM Federal, CSC, Darlington, Focused Research, Hughes, I-Net, SAIC, Taylor-Oden, Unisys
Task Areas	• Requirements Analysis • Exercise and Real World Contingency Support • Support to the Space Applications and Integration Facility (SPAIF) • Support to SAR Programs

Contract Vehicle Summaries (continued)

FAA-Human Resources Contract

Contract No. & Name	FAA -Human Resources/Training Contract; TFA01-95-R-111701
Contract Type	IDIQ-Time and Material, (T&M)
Period of Performance	Base Period: 10/95-10/2000
Contracting Agency	Federal Aviation Administration 800 Independence Avenue, SW Washington, DC 20591
Contracting Officer	John H. Graham (202) 267-3617 Lillie M. Harris (202) 267-5149
COTR	TBD
Authorized Users	All Federal Agencies
Contract Min & Max	Min: None Max: None
Contract Rates	Available on request
Admin/Handling Fee	17%; Call for current rate
Funding Limitations	Unknown
General Scope	Distance Learning, Training System Courseware, Analysis and Training Management, Video teletraining support packages, Instructional Systems R&D
Prime Contractor	• Crown Corporation • Analysis & Technology

Contract Vehicle Summaries (continued)

ITOP

Contract No. & Name	Information Technology Omnibus Contract (ITOP)-DOT
Contract Type	ID/IQ, Cost-Plus Fixed Fee (CPFF), Fixed Fee
Period of Performance	Base Period: 10/96-10/2003
Contracting Agency	Department of Transportation
Contracting Officer	Mitch Peterson: (804)460-5173
COTR	TBD
Authorized Users	All DoD and component agencies; all Federal Agencies
Contract Min & Max	Min:$30K Max: $50 M
Contract Rates	Available on request
Admin/Handling Fee	1%-3.5% depending on DOT's Administrative Role
Funding Limitations	Unknown
General Scope	Telecommunications Systems Integration, Configuration Management, Operations, Maintenance, Computer Networking Engineering.
Prime Contractor	Unisys, BDM, Signal Corp
Task Areas	• Informations Systems Engineering • Systems/Facilities & Management • Training
Contracting Process	• Program Office develops task order funding and SOW documents • Contracting Office requests Delegation of Contracting Authority (DCA) from DOT • Program Office Forwards documentation to contracting office • Contracting office issues task order to ITOP contractors • Contractors express interest and commit to bid • Contractors submit oral or written task order proposal • Program office evaluates task order proposals and selects a contractor • Task order turnaround — **30 Days**

Contract Vehicle Summaries (continued)

MFAC

Contract No. & Name	Major Functional Area Contract (MFAC)/DTCG39-94-D-E56616
Contract Type	ID/IQ-Time & Cost Plus
Period of Performance	94 Aug-Aug 99
Contracting Agency	USCG Research and Development Center
Contracting Officer/Specialist	Joyce Overton: (860) 441-2738
COTR	Jack McCready (860) 441-2738
Authorized Users	USCG; all Federal Agencies
Contract Min & Max	Min: TBD Max:
Contract Rates	TBD
Admin/Handling Fee	0
Funding Limitations	$90 Million
General Scope	Integrated Logistics Support, Training, Training and Evaluation in several USCG Mission areas—*SAR, ELT, DEP OPS, MEP and IO*
Prime Contractor	Analysis & Technology (A&T); A&T Site Representative-Steve Ricard (860) 441-2867
Task Areas	• Requirements Analysis • ILS • Program Assessment/Mission Analysis • Expert System/Artificial Intelligence • Support to critical USCG Mission Areas

Contract Vehicle Summaries (continued)

NAWC/TSD

Contract No. & Name	NAWC/TSD
Contract Type	ID/IQ-Firm-Fixed Price
Period of Performance	Base Period: 10/92-10-99 with possible bridge every 24 months
Contracting Agency	Department of the Navy Naval Air Warfare Center, Training Systems Division 12350 Research Parkway Orlando, FL 32826-3275
Contracting Officer	Rex Major (407) 380-8503
COTR	TBD
Authorized Users	All Federal Agencies
Contract Min & Max	Min: TBD Max: None
Contract Rates	Available on request
Admin/Handling Fee	Call for current rate
Funding Limitations	Unknown
General Scope	Distance Learning, Training System Courseware, Analysis and Training Management, Video teletraining support packages, Instructional Systems R&D
Coast Guard Liaison Officer	An O5 Coast Guard officer is regularly assigned as liaison officer to NAWC-TSD. Phone number is (407) 380-8427
Prime Contractor	• Jardon and Howard Technologies • Analysis & Technology, Inc. • Scientific Systems, Inc.

Contract Vehicle Summaries (continued)

NIH-CIO-SP

Contract No. & Name	National Institutes of Health, Chief Information Officer Solutions and Partners (CIO-SP)
Contract Type	ID/IQ-Time & Material Task Orders (T&M), Firm-Fixed Price (FFP), Cost Plus Fixed Fee (CPFF), Cost Plus Award Fee (CPAF)
Period of Performance	Base Period: TBD
Contracting Agency	National Institutes of Health Division of Procurement, NITACC 6120 Executive Boulevard, Rm 884 Rockville, MD 20892
Contracting Officer	Gale Greenwald (301) 402-3345
COTR	TBD
Authorized Users	All Federal Agencies
Contract Min & Max	Min: TBD Max: $100 M
Contract Rates	Currently all SITE rates-work to performed in either CSC or Government facilities. 44 labor categories proposed
Funding Limitations	Unknown
General Scope	• IT Operations support • Reinvention Resourcing • Information Technology Security (ITS) • Year 2000 Software Strategies, Reprogramming and Solutions
Prime Contractor	• Computer Science Corporation (CSC) • Betac Corp.
Task Areas	• Requirements Analysis • Testing and Evaluation • Instructional Systems Development • Telecommunication and Systems Integration • Configuration Management

Contract Vehicle Summaries (continued)

NSWC PHD DAM NECK

Contract No. & Name	Naval Surface Warfare Center -NSWC PHD Dam Neck
Contract Type	ID/IQ-Firm-Fixed Price
Period of Performance	Base Period: 10/92-10-97
Contracting Agency	NSWC PHD Dam Neck Port Huenemene Division East Coast Operations Directorate Naval Surface Warfare Center 1920 Regulus Ave Virginia Beach, Virginia, 23461-2097
Contracting Officer	Don Lancaster (757) 433-8372
COTR	TBD
Authorized Users	All Federal Agencies
Contract Min & Max	Min: TBD Max: None
Contract Rates	Available on request
Admin/Handling Fee	1%
Funding Limitations	Unknown
General Scope	Distance Learning, Training System Courseware, Analysis and Training Management, Video teletraining support packages, Instructional Systems R&D
Prime Contractor	• Semcor • Signal Corp.

Contract Vehicle Summaries (continued)

OPM-Training Management Assistance (TMA)

Contract No. & Name	U.S. Office of Personnel Management (OPM); Training Management Assistance Division; OPM Contract-OPM 97-TM 0100
Contract Type	ID/IQ-Firm Fixed Priced Delivery Orders (FFP)
Period of Performance	October, 1996 through Sept. 30, 1997; with 4 option years
Contracting Agency	U.S. Office of Personnel Management (OPM); Training Management Assistance Division, Roslyn, VA
Contracting Officer	Joyce Milner: (703) 573-1378
COTR	TBD
Authorized Users	All Federal Agencies
Contract Min & Max	TBD
Contract Rates	Available on request
Admin/Handling Fee	15%
General Scope	• Workforce Productivity • Management Training • Instructional R&D • Human Factors Engineering • Video & Multimedia • Distance Learning Applications

OPM-TMA, Continued

Prime Contractor	Analysis & Technology General Physics Computer Science Corporation SAIC Star Mountain C^2 Multimedia The Learning Group
Contracting Process	• The client identifies a need for services/products • The client, with or without OPM assistance, prepares a SOW describing the proposed program requirements, the required deliverables and the criteria use for guiding contractor selection • Cost estimates may be introduced at this time or determined upon contractor response at or oral or written presentation • Client submits SOW to OPM for acceptance of program. Upon approval OPM and client agency prepares an inter-agency agreement and transfers partial or total project funds. The funds can cover start-up or several tasks. Once funds are transferred, OPM invites a selected number of contractors to an oral presentation (generally no more than 3 contractors) based on a review with the client of the firm's capabilities. This usually involves the contractor that referred the work to OPM. Upon completion of the oral presentation, the client selects a firm to submit a management plan. This is paid for by the client. The parties may request a start-up meeting to clarify SOW r3equirements. Tow or more contractors may be asked to write a Management Plan. • The Management Plan describes the purpose, method, deliverable and level of effort for the project. Upon acceptance of the management plan. A work order (WO) is then issued by OPM to start work. • This process usually takes less than a week if the Management Plan is not too extensive Projects can be incrementally funded and be started on a task-by-task basis; however, tasks cannot be issued a work order unless sufficient funds to cover the tasks are available. This allows a client to add funds to current management plans and modify the scope of work as the project progresses.

Space Warfare Center Operations Support Contract

Contract No. & Name	Space Warfare Center Operations Support Contract F05604-96-D-9001
Contract Type	ID/IQ-Cost Plus Award Fee (CPAF) Delivery Orders
Period of Performance	Base Period: 12/8/95-9/30/96 Option Periods: 4 one year options
Contracting Agency	21 CONS/LGCX 135 E Ent Avenue, Suite 101 Peterson AFB, CO 80914-1385
Contracting Officer	Geraldine Humphrey-(719) 556-7450
COTR	Contract Quality Assurance Evaluator (CQAE): Major Jeffery Christoff, Space Warfare Center/XRM-(719) 567-9572
Authorized Users	SWC, USSPACECOM, USAF and other civilian agencies
Contract Min & Max	Min: 60,000 Hours-Max: 480,000 Hours per Year-No D.O. Min or Max
Contract Rates	Hourly rates used for estimating purposes only. Uncompensated overtime is proposed.
Funding Limitations	Primarily O&M but may accept up to 10% of contract value in R&D funds
General Scope	Provide operations support and technical and technical expertise to SWC and TENCAP programs in planning and programming for the integration and use of DoD Space NS, and SAR programs within all Air Force mission areas. Limited support to the Space Applications Program Office located at SMC/XRS Los Angeles AFB, CA may be required. SWC efforts will support all MAJCOM and component responsibilities. The effort will be directed towards but not be limited to supporting development and evaluation of prototype systems to determine potential operational utility; improving the efficiency of collection management and system tasking in support of military operations; increasing the frequency, realism and scope of exercises and training with Space and NS capabilities; developing analytical capabilities, including procurement of hardware and software for assessing the value-added of space systems in support to military operations with emphasis on air operations; education and training activities including war games; supporting efforts to influence the tactical utility of future Space and NS assets; and providing detailed support for Real World contingencies, exercises, and demonstrations of Space & NS capabilities at all levels of command
Subcontractors	Aerojet, Autometric, BDM Federal, CSC, Darlington, Focused Research, Hughes, I-Net, SAIC, Taylor-Oden, Unisys
Task Areas	• Requirements Analysis • Exercise and Real World Contingency Support • Support to the Space Applications and Integration Facility (SPAIF) • Support to SAR Programs

Contract Vehicle Summaries (continued)

VOLPE-National Transportation Systems Center

Contract No. & Name	VOLPE/National Transportation Systems Center
Contract Type	ID/IQ-Time & Material Task Orders
Period of Performance	Base Period: TBD
Contracting Agency	U.S. DOT National Transportation Systems Center Kendall Square Cambridge, MA 02142-1093 (617) 494-2552
Contracting Officer	TBD
COTR	Dr. Sylvia A. Harris, (617) 494-2552
Authorized Users	DOT; and all Federal Agencies
Contract Min & Max	Min: $5K Max: $90M
Admin/Handling Fee	Negotiable
Funding Limitations	TBD
General Scope	• Transportation and Security • Environmental protection and remediation • Instructional Systems Development/Interactive Courseware • Transportation Infrastructure R&D
Prime Contractor	Brattle Systems, Inc.
How to Initiate Project	• Develop, with Volpe participation, a basic Project Plan Agreement (PPA). PPAs describe the general scope, level of effort, and deliverables of the project. The initial task of a PPA may be for Volpe to develop a more detailed project implementation plan. • Identify the PPA title and funding in your agency's next General Working Agreement (GWA) with Volpe. The GWA transfers obligation authority to Volpe's Working Capital Fund for work on the Specific PPAs
Approval Time	• Volpe's project managers can inform you of your agency's GWA and PPA approval processes and time lines • turn-around time at Volpe for GWAs is usually a few days

Appendix E

Recommended ICW Architecture

For discussion purposes we have compiled the following list of minimum recommended ICW system configurations. However, given the rapid advancement of technology, these specifications become quickly outdated, so we recommend that development equipment be the most robust available for reasonable costs.

Component	Multimedia	Development
CPU	Pentium 90	Pentium 166/200
RAM	• 32 Mb • Expandable to 128	• 64 Mb • Expandable to 128
Power Supply	250 Watt	250 Watt
Expansion Slots	7	7
BUS	ISA (16 bit) or PCI	ISA (16 bit) or PCI
Case	• Mini-tower or desktop • 5 bays	• Mini-tower or desktop • 5 bays
I/O	• high density 3.5 diskette • 1 Gb hard disk • Option: Removable • storage media (hard	• high density 3.5 diskette • 2 Gb hard disk Option: Removable storage media (hard drive, Syquest, drive, Syquest, Jaz, etc.) Jaz, etc.)
Graphics Adapter	• Super VGA • must include VESA, • VGA BIOS extension 1.2 • or higher	• Super VGA • Must include VESA, • VGA BIOS extension 1.2 • or higher
Video Display	• capable of 1024 X 768 • 64K colors • .28 dot pitch • Non-interlaced • multi-sync • at least 15"	• capable of 1024 X 768 • 64K colors • .28 dot pitch • non-interlaced • multi-sync • at least 15"
Keyboard	101 or 102 key	101 or 102 key

ICW Architecture Table, Continued

Operating System **Audio**	Windows 95/NT • Windows compatible • provide waveform and MIDI audio • play from board and CD-ROM or videodisc simultaneously • play and record stereo waveform audio using 8 and 16 bit linear PCM sampling at 11, 22 and 44 kHz • connection for CD-ROM • speakers or headphones	Windows 95/NT • Windows compatible • provide waveform and MIDI audio • play from board and CD-ROM or videodisc simultaneously • play and record stereo waveform audio using 8 and 16 bit linear PCM sampling at 11, 22 and 44 kHz • connection for CD-ROM • speakers or headphones

Appendix F

Glossary

Terms	Definitions
Authoring Software	Computer programs designed to aid in the creation of computer based training.
Balloon Help	A help callout describing the function of a button or icon that pops up automatically when the cursor is placed over that button or icon.
Bookmark	A bookmark allows the student to exit the lesson when they want and then reenter the lesson at the same place they left.
Branch	To jump from one sequence in a lesson to another.
Button	An icon used as a navigation tool.
CAI	Computer Assisted Instruction
CBT	Computer Based Training
CMI	Computer Managed Instruction
Color Palettes	Selection of compatible colors sharing a tone, clarity, and intensity. Normally either blue/pink based (cool) or yellow/red based (hot).
COTR	Contracting Office Technical Representative
Data Base	A collection of data stored in a computer-readable form.
Deliverable	The Product at the end of a development phase; a tangible output that can be handed to others for review or use according to Gloria Gery in *Making CBT Happen.*
Design	According to Gloria Gery in *Making CBT Happen*, to design is to conceive and plan; to draw plans for. Also, the plan itself. Computer based training requires design from the broadest outline of the program down to the specific arrangement of the elements in each screen.
Digitized	To convert into digital computer format.
EPSS	Electronic Performance Support System
Feedback	Information to the student about the results of an action used to improve performance on future actions
Flowchart	A diagram consisting of a set of symbols (e.g., rectangles, diamonds) and connecting lines that shows step-by-step progression through a complicated procedure or path.
Font	A set of printing type of one size, face, and style.
Frame	A single screen in a lesson
Freeware	Copyrighted software given away for free by the author who retains all rights and ownership.
Functional Area	A dedicated area on the screen for placement of text, visuals, navigation buttons, and progress information.

Hot Spot	According to Robert J. Zielinski in *Using Macromedia Authorware 3.5*, hot spots create an invisible area in the presentation window in which the user must single-click, double-click, or simply position the mouse pointer over. When the user interacts with the invisible area, the piece continues past the interaction icon and down the flowline. Also known as a touch zone.
Hyperlinked Help	Displays hot spot text that is hyperlinked to additional help topics.
ICW	Interactive Course Ware
Icon	A small picture used to represent a function
Image	Visual element on the screen, normally a graphic, photograph, or video.
IVD	Interactive Video Disk
Layout	The way a screen is designed. Placement of text, graphics, navigation bars, etc.
Learning Strategies	Learning Strategies are mental "operations or procedures that the student may use to acquire, retain, and retrieve different kinds of knowledge and performance" according to J. Rigney in Learning Strategies: A Theoretical Perspective
Libraries	According to Robert J. Zielinski in *Using Macromedia Authorware 3.5*, libraries are external files that contain content resources such as graphics and sound. Rather than storing multiple copies of a content element in the piece, you can create a library, then establish links to the content in the library.
Media Selection	The process of selecting the most effective means of delivering instruction.
Milestone	A significant or important event.
Models	According to Robert J. Zielinski in *Using Macromedia Authorware 3.5*, models are used to make the development of the flowline structure more efficient.
Module	A portion of a lesson that represents related topics. Also referred to as a segment.
Navigate, Navigation, Navigational	The means by which a student progresses through a lesson (i.e. forward, back, exit).
Object	One design element. A single key stroke. For example, one rectangle is one object.

Offeror	An individual, agency, or business concern who submits a proposal in response to a Government RFP.
Pixel	Pixels are a unit of measurement sometimes referred to as dots. A pixel is a unit of light as displayed on the monitor and is measured in pixels per inch. The more pixels per inch displayed on the screen, the higher the resolution. Pixels are also used to define an image size such as 240 X 320.
QRP	Quality Review Process; a checklist used while developing and reviewing a process.
QRP	Quality Review Program
RFP	An RFP, or Request for Proposal, is a formal invitation for offerors to submit a proposal to satisfy a stated Government need.
Remediation	Information provided to a student to correct misconceptions, fill memory lapses, or add to incomplete learning.
Resolution	Defines how many pixels per inch are displayed on the screen. Some common screen resolutions are 640 X 480 (VGA), 800 X 600 (Super VGA), 1024 X 768 (Ultra VGA), with the horizontal axis listed first.
SOW	The SOW, or Statement of Work; states the Government's needs in terms of work tasks (e.g., work to be performed in developing or producing the goods to be delivered or services to be performed by a contractor.
SME	According to Gloria Gery in *Making CBT Happen*, an SME, or Subject Matter Expert; is a content expert used as a consultant in an instructional system's design effort to ensure the accuracy of factual material in a lesson.
Scanner	A piece of equipment used to digitize printed material such as photographs, slides, etc.
Screen	Each computer display. Also referred to as a frame.
Screen Depth	Defines how many colors are displayed on the screen. Contains the number of bits used to represent each screen pixel in display memory. Some common configurations are 256 colors (8-bit), thousands of colors (16-bit or Hi-Color), millions of colors (24-bit or True-Color)
Shareware	A distribution method of software which allows its use for a specified period of time without payment.
Segment	A portion of a lesson that represents related topics. Also referred to as a module.
Template	A pattern or guide used to create duplicate frames/screens. A template can also be used for instructional sequences or entire CBT programs.

Task	A single unit of specific work behavior with clear beginning and ending points that are directly observable or otherwise measurable. A task is performed for its own sake, that is, it is not dependent upon other tasks, although it may fall in a sequence with other tasks in a duty or job.
Text Box	An area where text is placed on screen.
Timed Overlays	Objects that automatically appear on the screen after a predetermined time.
Tool Tip	A help callout describing the function of a button or icon that pops up automatically when the cursor is placed over that button or icon. Usually provides more information than a balloon help button label.
Touch Zone	The same as a Hot Spot. See Hot Spot for a definition.
Visual	The screen element that primarily appeals to the student's sense of sight. Normally, a graphic, photograph, video, or some other element that is visually stimulating.

Appendix G

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